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# COMPUTERWORLD

## Cisco offers open APPN option

*APPI pitched as alternative for blending SNA with distributed nets*

BY JOANIE M. WEXLER
CW STAFF

MENLO PARK, Calif. — Cisco Systems, Inc. stunned the industry last week with a gutsy challenge to IBM's Advanced Peer-to-Peer Networking scheme for migrating its hierarchical Systems Network Architecture to distributed internetworks.

The router market leader announced that it is developing an "open" APPN alternative, dubbed Advanced Peer-to-Peer Internetworking, due out in the third quarter of next year.

APPI is aimed at the plethora of commercial customers who run both large SNA networks and local-area network internetworks, according to Michael H. Zadikian, Cisco's SNA product manager.

### IBM warning

The move follows an IBM briefing on APPN that angered some developers because IBM issued a strong warning that APPN developers had better first license IBM's patented technology [CW, Aug. 17].

General user and analyst reaction was that the Cisco offer will ease user architecture migration headaches, force IBM to own up to its APPN Network Node licensing and deployment timetables and get the APPN ball rolling. IBM has already published APPN End Node specifications that give any vendor's device access to APPN network resources.

However, IBM has dragged its feet on letting competitors get their hands on APPN Network Node's sophisticated directory and routing functions for coordinating resource-sharing across peer-to-peer networks, sources said.

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## Users want action from IBM PC unit

*Service, prices, delivery cited as key concerns*

BY CAROL HILDEBRAND
and MICHAEL FITZGERALD
CW STAFF

SOMERS, N.Y. — After weeks of boisterous speculation, IBM quietly spun off its personal computer hardware organization into a separate unit last week, saying it is now able to play for keeps in an arena where it has increasingly seemed unable to compete.

The new IBM Personal Computer Co., headed by Robert Corrigan, former president of the Entry Systems Division, effectively blends Entry Systems with IBM's National Distribution Division.

An approximately $7 billion company, it will feature PC marketing, vastly slimmed-down distribution, product development and manufacturing all under one roof, which Corrigan said will allow it to get better products to the right markets faster.

### Demanding results

Skeptical users and analysts said they are more interested in tangible results than in yet another reorganization by the stumbling computer giant.

"What [IBM does] in terms of organizational structure is not the key issue," said Richard E. Nelson Jr., vice president of agency systems at New York Life Insurance Co. He said IBM needed to better target its products as well as lower its prices. "I'll wait and see — this could just be smoke and mirrors."

Nelson added that there were no IBM products on New York Life's list of approved products

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## NetWare, host integration still elusive

BY MICHELE DOSTERT
CW STAFF

Eighteen months after Novell, Inc. and IBM announced a new partnership designed to ease integration of NetWare into traditional IBM environments, users said the strategic alliance has so far failed to fill in some gaping holes in the blueprint for NetWare-to-IBM coexistence.

Novell has introduced its NetWare for SAA product, added NetView reporting to its management products and released a NetWare OS/2 requester. Although it now supports NetWare's SPX/IPX protocol, IBM has mostly concentrated on helping Novell connect to and be manageable from the IBM mainframe. IBM has yet to release products that would simplify NetWare connectivity from the IBM side.

Meanwhile, many users are addressing the problem by connecting their NetWare local-area

*Continued on page 16*

SALARY SURVEY

**Comparison of annual salaries**

| | ♂ | ♀ | % | $ |
|---|---|---|---|---|
| | Male | Female | % diff. | $ diff. |
| Average (all IS managers) | $61,240 | $50,466 | 21% | $10,774 |
| IS director/manager | $59,896 | $50,716 | 18% | $9,180 |
| Technical director/manager | $51,651 | $45,174 | 14% | $6,477 |
| Systems directar/manager | $51,704 | $48,769 | 6% | $2,935 |
| Programming management | $55,687 | $54,580 | 2% | $1,107 |

Source: *Computerworld* 1992 Salary Survey

CW Chart: Stephanie Faucher

## IS pay dips; women still lag

Monetarily speaking, the only thing harder than being an IS manager this year is being a female IS manager. *Computerworld*'s 1992 Salary Survey found that top management posts took some of the biggest salary hits. This news is particularly bad for women, who earn less than their male colleagues in all positions and significantly less in top jobs. Network managers sustained heavy losses, with salaries declining by almost 9%. See Executive Report, page 85.

## IS staffers consider the union label

*Advocates say increased job security, technical training are key benefits*

BY JEAN S. BOZMAN
CW STAFF

The work environment of an information systems professional is notorious for quirky hours, overnight shifts and constant change. Yet a small slice of the IS work force in the U.S. has found a unique way to combine skills with guaranteed technical training and protection from sudden layoffs: Those workers spent Labor Day as card-carrying union members.

In a recessionary economy, with automation of computer operations, downsizing, outsourcing and offshore programming threatening many high-tech jobs, some see unions as providing a higher level of job security, which is typically based on seniority.

IS employees noted that stability is the chief benefit of union membership. "It does afford an amount of protection from management mood swings," said a Boston-based Massachusetts Department of Employment Training programmer who asked not to be identified. "You have to do something substantially wrong to be dismissed."

Still, the union contract that covers the agency's 2,000 workers has lapsed, and state workers — who pay $5 a week for union dues — have not had a pay raise in four years, noted Joseph Garbino, the agency's assistant IS director.

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## INSIDE

ANCHOR'S THE ANSWER!

Bob Sacha

**Anchor Bank CEO James M. Large Jr.** is braving the uncharted depths of re-engineering. See CEO View, page 93.

NEWSPAPER

25
Leading IS
Since 1967

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Leading IS
Since 1967

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## Quotable

*"It does afford an amount of protection from management mood swings. You have to do something substantially wrong to be dismissed."*

PROGRAMMER
MASSACHUSETTS
DEPARTMENT OF
EMPLOYMENT TRAINING

*On the advantages of being unionized. See story page 1.*

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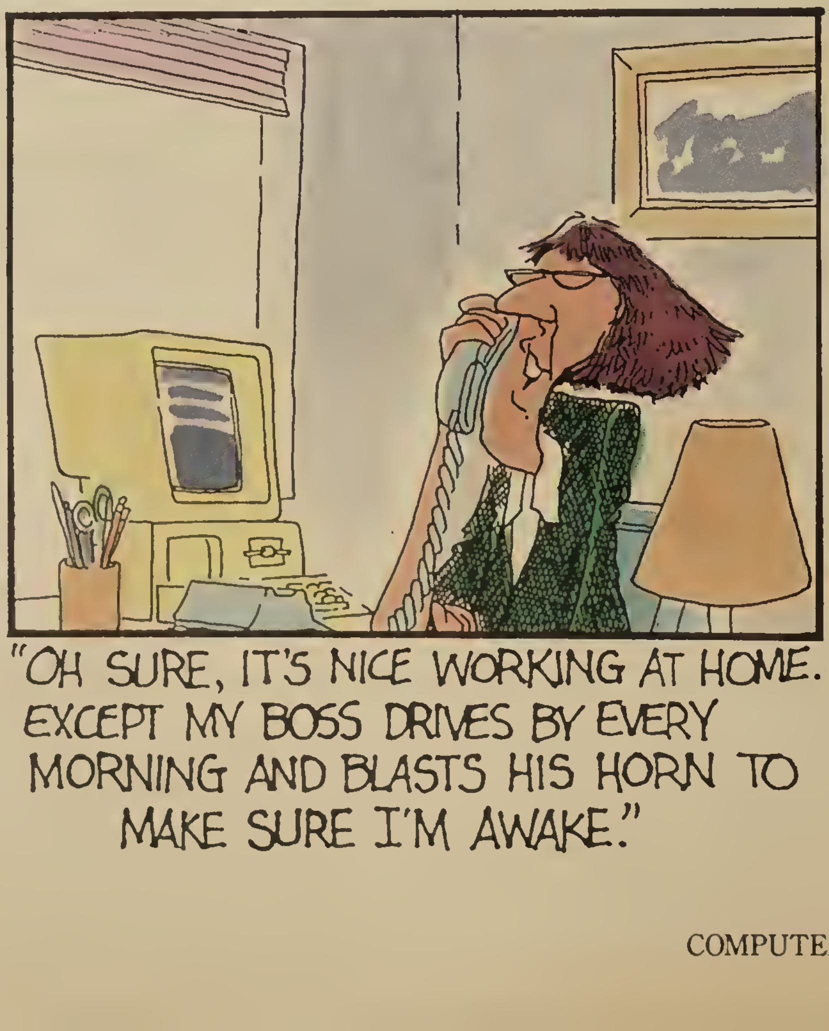
## The 5th Wave



"OH SURE, IT'S NICE WORKING AT HOME. EXCEPT MY BOSS DRIVES BY EVERY MORNING AND BLASTS HIS HORN TO MAKE SURE I'M AWAKE."

# EXECUTIVE BRIEFING

■ **Users say IBM's PC spin-off must become more price and service conscious if it is to succeed.** But a moment of truth lies ahead for IBM: the user jury's verdict on whether a spate of upcoming product lines pass price/performance criteria. **Page 1.**

■ **IS professionals' salaries are down this year, and that's not all: IS staffers will have to do more for their money,** according to CW's 1992 Salary Survey of information systems managers and professionals shows. The money drop is top-down: The survey logs a 4% to 9% salary slide for CIOs, IS directors and network managers. **Page 85.**

■ **Unions represent only a small percentage of all IS shops nationwide, but they have a steady hold** on shops in some sectors, including state and local government, telecommunications, transportation and hospitals. Members laud increased job security and technical training; some IS managers, however, shudder at the thought of unionization. **Page 1.**

■ **Make way for 'internal information integrators.'** These technically and socially skilled staffers put together a plan for getting at data wherever it resides and mustering the resources needed to put the plan in action. **Page 91.**

■ **Stung by allegedly broken support and development promises from CA,** the city of Boston's IS department is giving the boot to both CA's software and its IBM mainframe platform. It is accelerating plans to move to client/server, Boston information systems chief Allan Stern says. **Page 7.**

■ **Cisco Systems boldly serves up an 'open' alternative** to IBM's slow-to-show APPN for blending SNA environments with distributed internetworks. **Page 1.**

■ **Eighteen months into a Novell/IBM pact aimed at easing NetWare into traditional IBM environments,** users are spotting yawning gaps in the blueprint for NetWare-to-IBM coexistence. **Page 1.**

■ **A new generation of handheld portable computing devices** will challenge IS efforts to oversee distributed technology. **Page 31.**

■ **Plans to put a global network in your pocket** with the help of a satellite system could bear fruit by 1998. **Page 24.** Scientists are eyeing the sky in search of a way to harness solar power for all those fiber-optic telecommunications lines that have become so popular. **Page 24.**

■ **IBM's 4381 family of small mainframes** may often be replaced by downsizing efforts, but it also serves as a primary stepping stone into new mainframe purchases. **Page 78.**

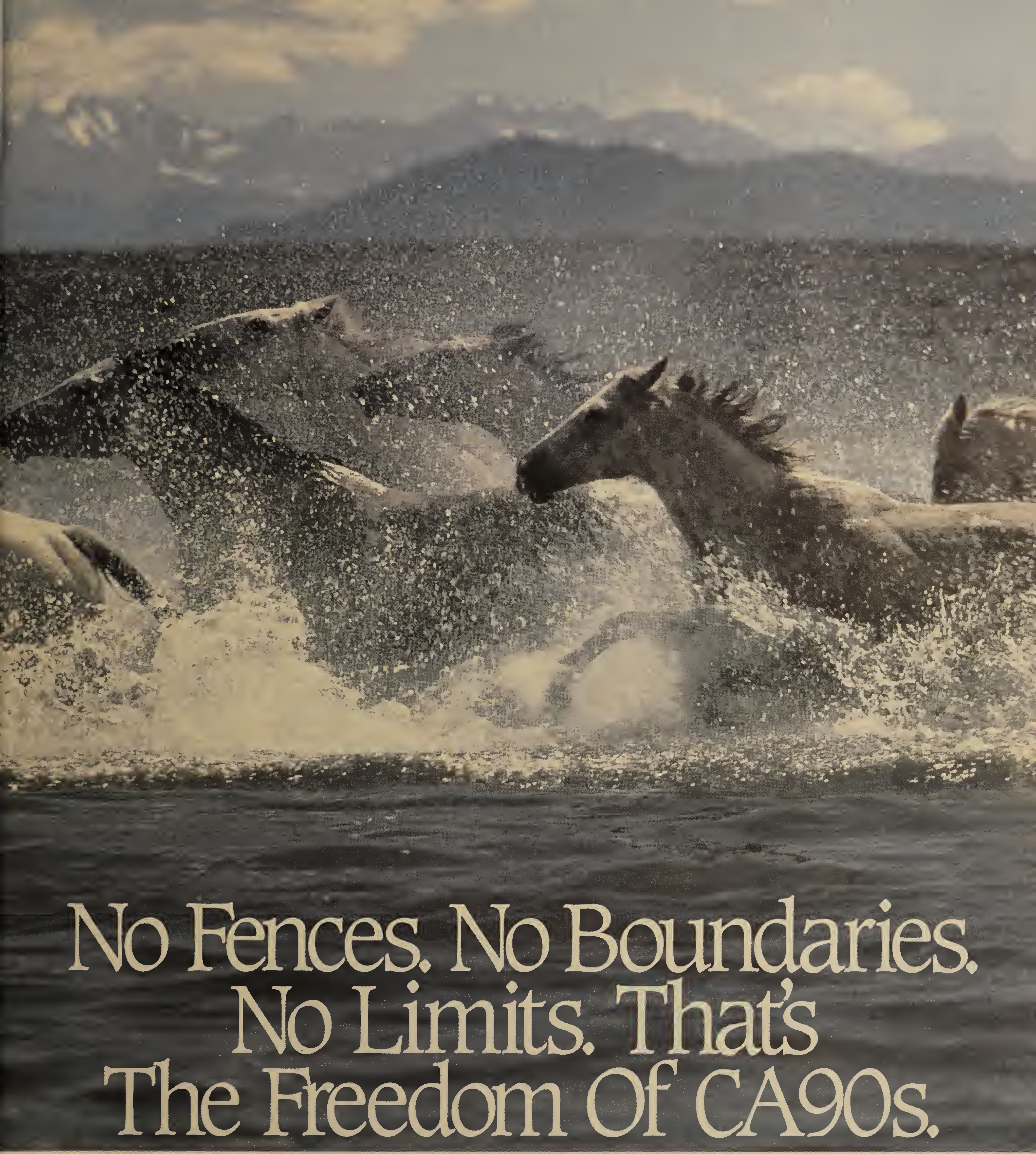
■ **The Federal Communications Commission finally finds merit** in the idea of leveraging the U.S. communications infrastructure as a step toward a massive nationwide network. **Page 69.**

■ **DEC attempts to glue together** disparate massively parallel architectures with new software releases. **Page 78.**

■ **KnowledgeWare users expect to see most of their concerns about module integration addressed** in the newest release of the company's CASE workbench, due out by year's end. **Page 81.**

■ **WordPerfect's renamed and revamped presentation graphics** package, Presentations Version 2.0, takes aim at the Big Three graphics packages. **Page 32.**

■ **On site this week:** EDI is the information-intensive way to move cargo for San Francisco's The Harper Group. **Page 69.** Burlington Northern Railroad pleases train schedulers with a move from mainframe to client/server computing. **Page 59.** Groupware is breaking the barriers of time, geography and group size at Texaco. **Page 59.**



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# DOS to add antivirus features

*Microsoft uses parts of Central Point's Anti-Virus tool for Version 6.0*

BY JAMES DALY
CW STAFF

REDMOND, Wash. — Microsoft Corp. will provide users with a first line of defense against computer viruses when it includes rudimentary virus protection features in the upcoming DOS Version 6.0, sources close to the company said.

DOS 6.0 is expected to include antivirus software licensed from Central Point Software, Inc., which produces both DOS and Microsoft Windows protection packages. The upgraded operating system, which entered beta testing last week, is expected to ship in early 1993.

A Central Point spokeswoman would acknowledge only that "a technology agreement is in place" between the two companies. But the firms are not strangers. Microsoft included Central Point's Undelete utility feature in DOS 5.0, which was released in June 1991.

Beta-test users of DOS 6.0 said they would be surprised if the entire Central Point Anti-Virus product would be included. It is more likely that the update will include a Central Point-derived checksumming routine that would tell the user when something virus-like was happening, such as unauthorized code replication or substitution.

"It would be nice to have some sort of basic checksum, but to have a full search-and-destroy program would be useless, considering how often viruses mutate," said Rich Eisenman, information systems officer at Chemical Banking Corp. in New York.

Once a virus was detected, users could instead bring in the big guns of a full-featured antivirus program to eliminate the offending code.

Observers said the checksum feature could easily be part of a disk-compression device driver because disk compression routines generally use "checksumming" to verify integrity and operate at the file level.

### Negative response

Some analysts were dissatisfied with Microsoft's choice of software from Beaverton, Ore.-based Central Point.

Critic Mark Hamilton wrote in a recent product review in the British magazine, *Virus Bulletin*, that Anti-Virus for DOS Version 1.2 missed several infections, particularly among encrypted viruses, and gave false positives for others.

Eli Shapiro, antivirus product development manager at Central Point, downplayed the review, claiming it assessed an old copy of Anti-Virus. He added that a newer version addresses the problem of polymorphic viruses.

Shapiro also pointed out that the publishers of *Virus Bulletin* are owners of a company called Sophos that produces the Sweep antivirus program. "So how can you expect their reviews to be objective?" he asked.

Indeed, several virus researchers gave an unequivocal thumbs-up to Central Point. When the Research Center of the National Computer Security Association in Washington, D.C., conducted a review of competing virus scanners earlier this year, Central Point's products were among the highest performers.

## Preventing infections

*Central Point's virus protection software gets strong ratings from analysts*

| | | |
|---|---|---|
| 🟩 | **Ontrack/Dr. Solomon's Anti-Virus Toolkit** | Quality scanning, good performance, average features |
| 🟩 | **Symantec/Norton Anti-Virus** | Quality scanning, lacks protective features |
| 🟥 | **Central Point/ Central Point Anti-Virus** | Excellent performance, scanning and usability |
| 🟦 | **Microcom/Virex for the PC** | Weak scanning, slow performance, unfriendly |
| 🟥 | **Xtree/ ViruSafe** | Excellent scanning, usability, good speed |
| 🟦 | **McAfee/ ViruScan** | Slow performance, unfriendly, ASCII manuals |
| 🟦 | **PC Guardian/ Virus Prevention Plus** | Slow performance, no Help, not intuitive |
| 🟥 | **Certus International/Novi** | Excellent performance, scanning, usability |
| 🟦 | **Certus International/ Certus 2.1** | Slow performance, validation check, poor manuals |

🟥 HOT 🟩 WARM 🟦 COLD

Source: Technology Investment Strategies Corp. CW Chart: Michael Siggins

# Borland exec accused of giving Symantec secrets

BY CHRISTOPHER LINDQUIST
CW STAFF

SCOTTS VALLEY, Calif. — The battle for development tool market share got dirtier last week when Borland International, Inc. claimed that a former employee may have been working for competitor Symantec Corp. before he left his post at Borland. Symantec denied the charges and accused Borland of using the case "to create publicity and to harass."

Borland has charged that Gene Wang, former languages unit vice president and general manager who left Borland last Tuesday, illegally transmitted information via electronic mail about Borland's marketing, product and business relations plans to Symantec and possibly to its president and chief executive officer, Gordon Eubanks. The transmissions allegedly occurred while Wang was still employed at Borland.

Symantec claimed Borland's charges are without merit and called the investigation "an attempt to inhibit others from hiring Borland employees."

Borland and Symantec compete primarily in the development tools arena, particularly in the C++ market. At Borland, Wang was in charge of all C++ development products.

Borland also filed a civil suit against Wang, charging him with "willfull and malicious" misappropriation of company information. According to the suit, Borland seeks damages "in excess of $25,000." The suit also charges that Eubanks and Symantec "wrongfully induced Wang to breach his contract with Borland" and seeks damages against them.

### Covering all the bases

The suit also sought several injunctions against Wang, Eubanks and Symantec to prevent them from disclosing or using Borland's trade secrets, to stop Symantec from employing Wang and requesting the return of all Borland trade secrets. Wang never signed a noncompete agreement.

Superior Court Judge Thomas A. Black granted a temporary restraining order, enjoining the defendants from obtaining, using or disclosing Borland trade secrets and from destroying any materials that originated at Borland. It also orders the defendants to return such materials to Borland.

The defendants were ordered to appear before the court on Sept. 17 to state any opposition to the order.

The next day, Borland claims, it found records of at least 10 MCI Mail messages that Wang had transmitted to Eubanks. Borland also stated that at a Sept. 2 exit interview, Wang refused to sign a statement indicating that he "had returned all Borland confidential information and that he had not disclosed Borland confidential information to others."

# IBM advances plan to merge OS/2, AIX operating systems

BY ROSEMARY HAMILTON
CW STAFF

WHITE PLAINS, N.Y. — IBM last week sketched out more details of its plan to meld the OS/2 and AIX operating systems, saying the goal is to have a single, micro-kernel-based operating environment within two years.

While OS/2 users said that sounds like a reasonable goal, they also said they have some more immediate concerns with OS/2 2.0. Two information systems managers said they are still hesitant to deploy the operating system until some bugs are fixed (see story at right).

IBM is charting a course to bring OS/2 and AIX development in line to "eliminate all the redundant, inconsistent [features] and replace that with a single set of [components]," said Lee Reiswig, assistant general manager of programming at IBM's Personal Systems Division.

The goal is to allow users to run Unix or OS/2 applications in either environment. In a broader sense, the idea is to build a portable and scalable operating system that users could take across various platforms, noted Tim Bajarin, president of Creative Strategies Research International, Inc. in Santa Clara, Calif.

"I will approve of anything, as long as it doesn't sacrifice speed," said Jeff Newman, an assistant vice president at Barclays Bank PLC in New York. "Otherwise, I'm not that interested in superior portability or running other apps on my operating system."

### Reliance on Mach 3

The future operating environment will be based on the Mach 3 micro kernel from Carnegie Mellon University. While OS/2 and AIX will use the same kernel, they will function as separate operating systems, although their primary difference will be their front ends, or "personality," as IBM calls it.

The two will share the basic system components such as memory management. "They can share these common services, so [for example] they would all get memory in the same way," Reiswig said.

In addition, higher level services will be shared as well. OS/2 database manager development was moved to Toronto and will be completed for both the personal computer operating system as well as AIX, Reiswig said.

The plan to provide Lotus Development Corp.'s Notes technology as an Extended Services component of OS/2 will also be transferred to AIX, Reiswig added. And, he said, the company will continue to improve the existing AIX and OS/2s.

At the same time, the company is also working toward providing compatibility with the object-oriented operating system at Taligent Corp., the joint effort between IBM and Apple Computer, Inc. Reiswig said IBM hopes Taligent will use the Mach 3 kernel as well, but it has not signed off on this decision yet.

## Bugging out

For now, some committed IBM OS/2 2.0 users are still working through some lingering operating system glitches.

"We think that when the [fix release] comes out, all our concerns will be resolved," said Robert Hecht, vice president of investment systems at Prudential Investment Corp. "Without it, we aren't going to roll it out onto our network."

IBM has committed to shipping a point release later this year that will include bug fixes and other promised features, such as a full-blown 32-bit graphics engine. The Microsoft Corp. Windows 3.1 support will also ship in that time frame but will not be part of the fix release, an IBM spokesman said.

# LOOK WHO'S COOPERATING ON A COOPERATIVE-SERVER DATABASE

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*Apple Computer, Inc.*

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# NEWS SHORTS

## Mellon, Shah settle suit

Mellon Bank Corp.'s week-old lawsuit against former top-ranking information systems executive Bipin C. Shah skidded to a halt last week as the parties settled out of court. Terms of the agreement were not disclosed. But, Shah said, the accords allay Mellon's fears that his newly minted banking services firm, Transaction Processing, Inc., and its employees — four of whom jumped ship from Mellon to sign on with Shah — "could take unfair advantage of Mellon's operations and customers."

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## HP shifts OpenView/Unix

Hewlett-Packard Co. is slated to announce this week the creation of a network and system management division, headed by former HP System Management Division head Robert Hoog. The division will have responsibility for the Unix version of HP's OpenView, which HP will continue selling directly to customers as an enterprise management system. HP's PC Software Division will assume responsibility for the Microsoft Corp. Windows version of HP OpenView, which will be sold primarily through value-added resellers, the vendor said. The reorganization addresses the very different markets each product targets.

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## Multivendor net standards set

The Network Management Forum announced the release of Omnipoint 1, an organized set of standards, specifications and technologies for achieving interoperability across multivendor network management systems. Omnipoint is a joint effort involving a number of user and vendor companies and major standards bodies such as the Corporation for Open Systems and the Open Software Foundation.

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## Reversal on reverse-engineering?

A U.S. appeals court lifted an injunction barring Accolade, Inc. in San Jose, Calif., from developing and selling video games compatible with products from Tokyo-based Sega Enterprises Ltd. In April, a lower court ruled that Accolade had violated Sega software copyrights by "reverse-engineering," or studying how Sega games work. Supporters of that common practice hope the appeals court's written decision, not yet issued, will vindicate reverse-engineering, which they say is vital for innovation.

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## Light damage in New York break

A 30-inch water main break in the financial district of lower Manhattan last week had little impact on the computer operations of firms housed in the two towers affected, according to company officials. At 55 Water St., the Securities Industry Automation Corp. (SIAC), a subsidiary of the New York Stock Exchange and the American Stock Exchange, switched to emergency backup generators. Chemical Banking Corp. and The Depository Trust Co., located in the same building as SIAC, reported no major disruptions. At 125 Broad St., telecommunications were disrupted for several hours after the building's communications systems were flooded in the basement.

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## Short takes

**Share**, an **IBM** user group, has elected a new president, **John A. Chapman**, a senior technology consultant at **Amoco Corp.** in Chicago. . . . **Mark F. Morin**, who became the first vice president of IBM's **Image Solutions** unit in 1986, has moved to the post of general manager of software marketing at **IBM U.S. James J. Gant** takes over Morin's old title. . . . Last week, IBM began shipping Network Services/DOS Version 1.0 for DOS and Windows, which is said to implement IBM's Advanced Program-to-Program Communications peer-to-peer protocol using significantly less memory than former products. . . . **Motorola, Inc.** last week enhanced one portion of its 68000 family of chips. Three of its 68300 series chips, which integrate peripheral components around a 68000 or 68020 core, had their speed increased.

*More news shorts on page 16*

# IS helps rebuild after Andrew

BY GARY H. ANTHES
CW STAFF

HOMESTEAD, Fla. — Lights flashing, Florida Highway Patrol cars escorted the 48-ft trailer onto the grounds of what remained of Homestead Air Force Base late last Monday night. Within hours, the van's multimillion-dollar cargo — an AT&T telecommunications switch trucked 1,500 miles from Chicago — had restored service to 1,400 telephones on the base.

The 5ESS switch in AT&T's "portable central office" was just one of many computers that have been wheeled or flown into South Florida to help with recovery efforts following Hurricane Andrew, which devastated the region two weeks ago.

Because the hurricane's eye moved over areas where there were few major businesses, most regional computer facilities escaped with minor damage [CW, Aug. 31]. According to a spokesman for Chicago-based Comdisco Disaster Recovery Services, seven companies moved their processing to a Comdisco backup facility prior to the storm, but by the weekend, all had returned home.

That weekend, some data center managers said they were still operating their facilities off diesel generators and had no idea when power would be restored. Others said they had power but that it was not reliable.

The Federal Emergency Management Agency (FEMA) set up a computer network spanning four disaster assistance centers in South Florida. The network can support 200 users, who process requests for disaster relief. A FEMA spokeswoman said the centers are handling some 7,000 applications a day.

The FEMA network — actually several local-area networks connected by T1 (1.5M bit/sec.) lines — uses a server from NetFrame Systems, Inc. in Milpitas, Calif. The server, which runs the Novell, Inc. NetWare operating system, is a fault-tolerant box with redundant components designed for mission-critical applications, the company said. Connected to the server is a fault-tolerant storage management system from Vortex Systems, Inc. in Pittsburgh that provides continuous backup of data files.

Ken Tarone, a hardware/software engineer at Vortex, said FEMA got the disaster claims processing system up last Monday, a week after the storm hit. "They couldn't get in touch with their vendors. But they had my phone number, so I helped them all weekend."

Indeed, Tarone said most of the equipment for the FEMA system had been procured during the five-day period after Andrew struck. "They were dealing with multiple vendors, and the funny thing is, I was getting calls from vendors that I didn't even know, asking me how to connect things," Tarone said.

FEMA has been widely criticized for slow response to emergencies, including Hurricane Andrew. Computer officials at FEMA could not be reached for comment, but a FEMA vendor said the federal agency had been preparing to test a new, quick-deployment computer system at the time the disaster struck.

The American Red Cross was better prepared with its information systems. Its Disaster Relief Operation Management Information System software is prepositioned at 300 locations across the country, including Orlando, Fla., and Baton Rouge, La. Within four days of Andrew's passage, the Red Cross had set up a NetWare-based Token Ring LAN in its temporary disaster headquarters in Miami.

"We deploy this whenever there's a large enough disaster to warrant automation," said Maribeth Luftglass, the Red Cross' manager of disaster systems development. She said it has been used hundreds of times in recent years.

The Red Cross uses the 12-node LAN and software it developed to perform damage assessment and keep track of staff, staff assignments, supplies, vehicles and expenses. Luftglass said the system shares data with other relief groups such as FEMA.

The U.S. Army established a "Humanitarian Depot" at the Miami airport and is supporting its operations with Intel Corp. 80386-based personal computers flown in last Wednesday.

# Microsoft says hidden APIs don't provide unfair edge

BY CHRISTOPHER LINDQUIST
CW STAFF

REDMOND, Wash. — Microsoft Corp. is busily trying to defuse the tension created over published reports last week that said its Windows-based applications use undocumented calls to Windows.

The reports were based on claims in the book *Undocumented Windows*, by Andrew Shulman, David Maxey and Matt Pietrek, that some Microsoft products, including Excel and Visual Basic, use undocumented functions of the Windows application programming interface (API) to perform certain tasks. Such calls appear in most operating systems and are used to leave "hooks" for future features.

While the reports indicated that several application vendors were angry about the finding — even claiming that Microsoft's application group was using its knowledge of Windows to unfair advantage — Microsoft Vice President Brad Silverberg claimed that company policy prohibits the use of undocumented calls in applications.

However, any such use by Microsoft is bound to raise the specter of unfair business practices. The Federal Trade Commission has an ongoing investigation into whether Microsoft holds an unfair advantage in the software industry stemming from its involvement in both the operating system and the applications market.

Silverberg did acknowledge that several undocumented calls do appear in some Microsoft applications, but he added that their use violated the policy. He also said Microsoft has produced a technical note explaining the use of each of the calls.

According to the paper, four of the 16 calls mentioned in the book are documented, six are obsolete and the remainder either have documented equivalents or are useless.

"There's no appreciable advantage that Microsoft develops from [its applications using] these calls," Silverberg said.

Indeed, later in the section dealing with Microsoft's use of undocumented functions, the authors conclude, "In fact, the use of undocumented Windows functions by Microsoft applications is probably no more nefarious than the use of undocumented Windows functions by [Symantec/Peter Norton Computing Group], Borland or any other company whose software must make Windows jump through hoops."

Jesse Berst, publisher of the "Windows Watcher" newsletter in Redmond, Wash., agreed. "I don't think that the Windows APIs mentioned gave any major competitive advantage" to Microsoft, he said.

# City of Boston dumps CA-Universe

BY THOMAS HOFFMAN
CW STAFF

BOSTON — The city of Boston is planning to replace several major applications based on software from Computer Associates International, Inc. after the Islandia, N.Y.-based software vendor failed to help the municipality migrate its software to an alternate platform as promised.

In fact, according to Allan Stern, director of MIS for the city, the decision to replace the software is forcing the city to convert to a yet-to-be-determined client/server configuration two years ahead of schedule from its current IBM 3090 200S MVS/ESA mainframe environment.

The city is planning to downsize nine applications written under CA's CA-Universe mainframe relational database management system to a client/server configuration during the next two years, Stern said. He added that repeated attempts to enlist CA's aid to ease migration from CA's Universe SQL database environment to CA's Datacom/DB RDBMS have gone unanswered.

Stern said the nine applications include three fire department management systems, an abandoned-car tracking system and a voter registration system, which support several hundred users.

> "THEY WERE unwilling to accommodate us with a new purchase price or a training option, so basically we got stuck by a company that doesn't stand by its word."
>
> ALLAN STERN
> CITY OF BOSTON

Stern said he first became anxious in October 1988 when the $1.5 billion software firm acquired Applied Data Research, Inc., a Princeton, N.J., software firm. He said Applied Data Research's flagship product, Datacom/DB, a competitive database management system, had a larger user base than CA-Universe, the mainframe RDBMS tool set that CA acquired in its 1983 purchase of Stuart P. Orr & Associates, Inc., a Pasadena, Calif., software firm.

Stern said he wrote several letters to CA executives expressing his concern that users of CA-Universe would receive secondary support after CA-Datacom/DB users. He added that he received a phone call from CA Chairman and Chief Executive Officer Charles Wang in March 1990 assuring Stern that CA would continue to support and develop CA-Universe.

In March 1991, Stern said he received a "form letter" from CA stating the company's intention to abandon future development of CA-Universe in favor of CA-Datacom/DB. Stern, upset after receiving the letter, called CA to find out how the city could possibly migrate its applications off CA-Universe to CA-Datacom/DB. Stern said he met once with a migration support team from CA. Stern said CA has not contacted him on the subject since last summer.

"They were unwilling to accommodate us with a new purchase price or a training option, so basically we got stuck by a company that doesn't stand by its word," Stern fumed.

"We dropped the ball in communicating with him, there's no question about that," said Mark A. Combs, CA's senior vice president of research and development. Combs has contacted Stern and set up a meeting between Stern and CA technical representatives for this week.

Combs said CA has continued to support its Universe product set since the company announced in April 1991 that it would no longer make enhancements to the product. Since then, CA has offered licensed Universe users a free trade for its CA-Datacom/DB database product.

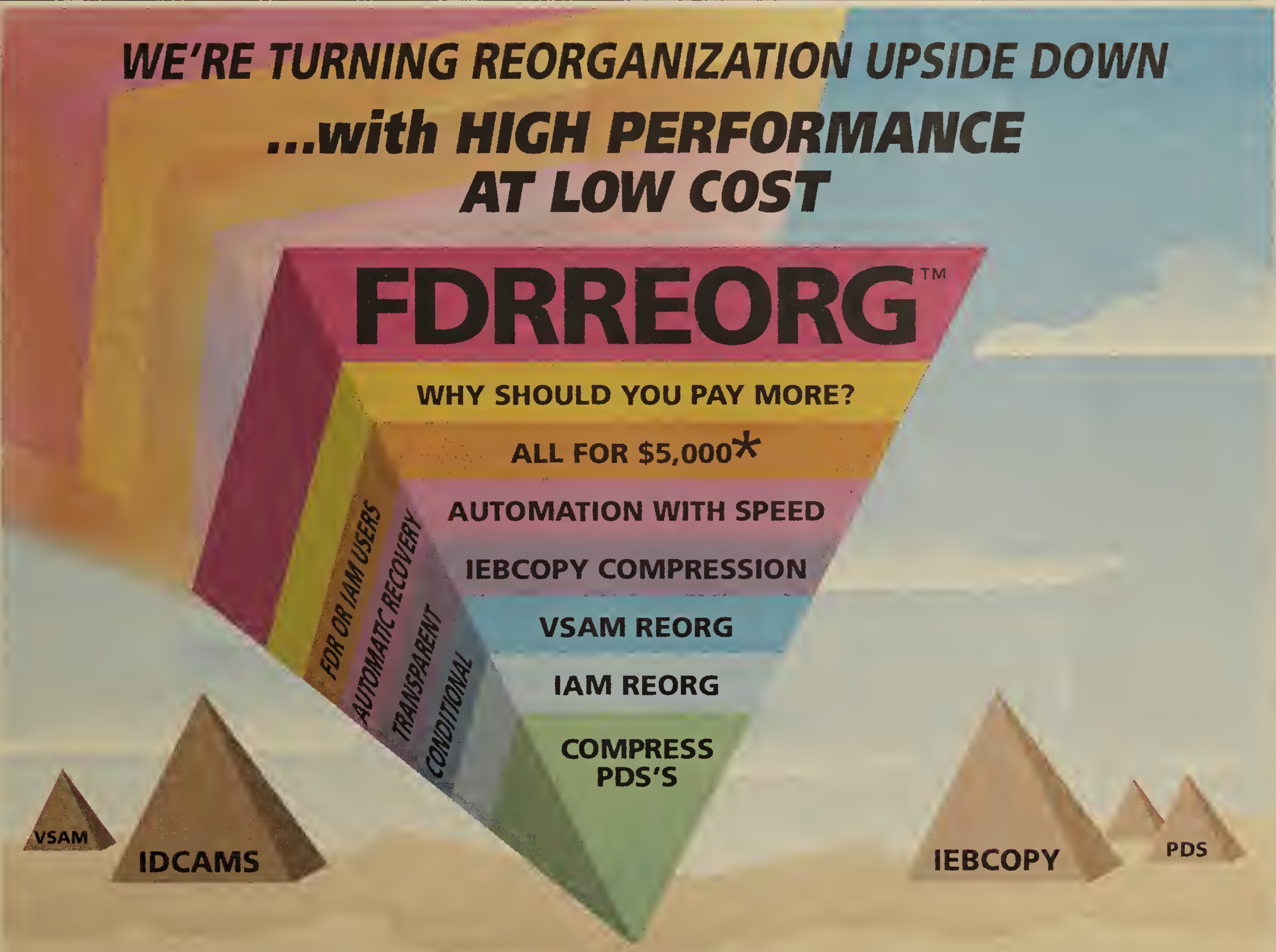
Stern was not able to disclose the cost of the conversion to the client/server environment, but he said the move would be "extremely costly."

Stern said the city will continue to use its IBM 3090 Model 200S mainframe as a data repository during the migration.

Stern's trouble with CA over CA-Universe has led him to replace his CA-Clipper application development environment with a competitive replacement, though Stern has not yet chosen a vendor. He said he is considering Borland International, Inc.'s Paradox tool set and Microsoft Corp.'s FoxPro, among others.

CA-Universe customers attempting to migrate to CA-Datacom/DB said they are experiencing different levels of success and frustration. "We haven't run into any problems we haven't been able to overcome," said Ann Stone, systems analyst at Scott Community College in Bettendorf, Iowa. The college, which began converting more than 300 Universe applications to Datacom/DB, is slated to complete the project by next summer.

Tom Kruse, a database administrator at Purdue University in Fort Wayne, Ind., has been less fortunate. Kruse said CA has yet to deliver on migration tools promised to him almost a year ago.



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# Tivoli to add apps for Unix nets

*Products offer software distribution, problem monitoring functionality*

BY ELISABETH HORWITT
CW STAFF

AUSTIN, Texas — Tivoli Systems, Inc. is expected this week to introduce two applications that target users who want to start implementing distributed Unix systems management and still be able to migrate to industry standards, such as the Open Software Foundation's (OSF) Distributed Management Environment (DME), when they become available.

Tivoli will announce Tivoli/Courier, which is said to automatically distribute software to multiple Unix systems, and Tivoli/Sentry, which is said to remotely monitor problems, performance and usage levels on distributed Unix systems. Both products are based on the Tivoli Management Framework, an object-oriented architecture that the OSF has adopted as part of its DME standard.

Hewlett-Packard Co. and IBM will shortly be bringing out DME-based network management products (see story at right). However, as developer of the object-oriented framework for the OSF's DME systems management standard, Tivoli is currently the only vendor that can promise future DME compliance for its systems management products, according to John Morrell, senior Unix analyst at International Data Corp. in Framingham, Mass. Tivoli has promised to migrate its products to the full OSF DME standard when it becomes available sometime in late 1993.

This makes Tivoli's applications of great interest to a small but growing band of companies that are committed to migrating their systems to the OSF's Distributed Computing Environment and DME standards.

Northwest Natural Gas Co., for example, chose Tivoli's management framework primarily because the company is "100% committed to DME compliance, plus we liked [Tivoli's] object-oriented approach," said Casey Canby, data center manager at the Portland, Ore.-based utility. The company is now looking to install both of the new applications, he added.

Tivoli/Courier allows users to create templates that describe a particular group of systems, such as brokerage trader workstations, so that software updates for the entire group can be initiated with one operation instead of on a case-by-case basis, Tivoli President Frank Moss said.

Tivoli/Sentry monitors printer, file and electronic-mail services, as well as other network services, Moss said. "The user designates what needs to be monitored," such as the status of the printer queue or how much free disk space is left on a server, he added. The network manager's console displays an alert when a preset threshold is exceeded (e.g., when too many Unix processes are running on one node).

The new applications will initially run on Sun Microsystems, Inc. SPARCstations, priced beginning at $375 a node for a 500-node license.

**Ground breaker**

The announcements further Tivoli's strategy of becoming "not just a technology supplier" but also an applications supplier, Morrell said. While Tivoli did announce some "general distributed Unix administration" applications earlier this year, this is the first time the company has come up with "new applications that haven't been done before," he added.

"The only systems management package I'm aware of that rivals [Tivoli's] is CA's Unicenter, which is very proprietary," said William D. Connor, vice president of information systems at Motorola, Inc.'s General Systems Sector.

General Systems is evaluating Tivoli's applications for "some major networks that we've been managing by brute force and awkwardness," Connor said, adding that he was particularly impressed with Tivoli/Sentry's ability to "snoop and see if things are degrading."

Connor also praised Tivoli's announcement this week of a Tivoli development tool kit for building distributed systems management applications for the Tivoli Management Environment.

## DME conformity

IBM and HP are expected to turn up the volume shortly on user interest in the OSF's DME by announcing network management products that conform to the DME Consolidated Management Application Programming Interface (CM-API).

CM-API, which was co-developed for the OSF by IBM, HP and Groupe Bull, enables applications to initiate management tasks via either the Open Systems Interconnect (OSI) Common Management Information Protocol (CMIP) or the Simple Network Management Protocol (SNMP).

HP is expected to announce the shipment of OpenView Unix Release 3.1 with support for CM-API-based access to SNMP and CMIP over Transmission Control Protocol/Internet Protocol. HP will also announce that Release 3.2, which will include full CMIP-over-OSI support, will ship in the fourth quarter.

IBM is expected in the next few weeks to announce Distributed Systems Management, an OS/2-based local-area network management system that will comply with IBM's SystemView architecture and also support CM-API.

While compliance with CM-API is only an initial step toward full DME compliance, it is an important one, according to David Passmore, a program director at Gartner Group, Inc. "Managing CMIP and SNMP via common semantics is a nice trick," he said.

ELISABETH HORWITT

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# Organization, not tools, key to LAN management

BY ELISABETH HORWITT
CW STAFF

NEW YORK — Technology may well be the last thing a company needs to look at as it struggles to put a local-area network management strategy together, according to a recent survey by Deloitte & Touche.

While many of the survey's 789 respondents complained of the lack of good network management products, particularly for LANs, they also cited their companies' organizational structures as impediments to effective enterprise network management, the consulting firm found.

And, information systems managers attested, it makes little sense to implement a network management system without resolving basic organizational issues, such as which department will take responsibility for which aspects of LAN operations and which procedures should be in place to ensure that the help desk finds out about a LAN problem before the users. Too often, procedures for timely identification and resolution of LAN problems are either sloppy or nonexistent, according to the study (see chart).

"Many organizations have not yet clearly defined an organizational structure with a clear delineation of responsibilities: this [LAN management task] is yours; this one is mine," said Glenn James, a Deloitte & Touche senior manager who co-authored the study performed by the firm's Telecommunications Consulting Service. As a result, "you have a situation where each group thinks the other is responsible, and things fall through the cracks."

**LAN load**

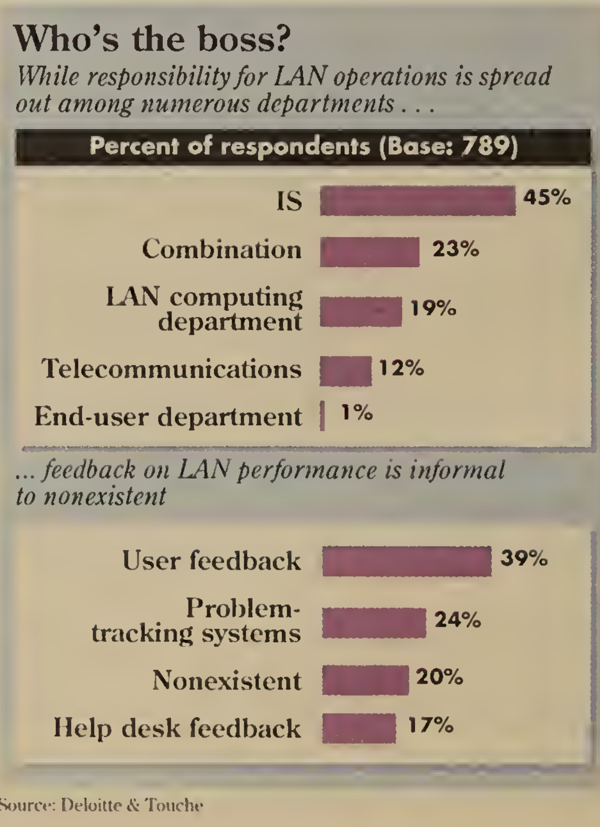
The rapid proliferation of LANs during the past year is making it increasingly difficult for organizations to get away with laissez-faire LAN management. More than 90% of organizations surveyed have multiple LANs installed, compared with approximately 60% last year, Deloitte & Touche said.

However, implementing a network management system without first ironing out procedures just "automates problems, which then become fire-eating dragons," said John Mahoney, manager of data processing at American Centennial Insurance Co. "I'm more interested in a combination of software and procedures, implemented in unison with the user community."

As a result, organizations ranging from General Electric Co. to the U.S. Air Force Materiel Command have been going through protracted and sometimes painful internal evaluations of their computer network support organizations, even before they start sending out requests for proposals for network management products.

Materiel Command, for example, is in the middle of a multimonth project to develop consistent procedures for troubleshooting and supporting computer networks across the command. The aim is to replace "postmortem network management" with active management that identifies a problem before it adversely affects the users, said Maj. Hal Ellis, who heads the project. Once the procedures are set, the command will take a look at which products make sense, he added.

More often than not, companies are dividing responsibility between a central information systems or telecommunications department and departmental LAN managers, the study found (see chart).



Source: Deloitte & Touche

"You can't just turn it all over to DP; that defeats the LAN's purpose of putting computing power into the hands of the user," Mahoney said. "You have to have guidelines for what is IS-[maintained] and what is user-maintained."

**Distributed the choice**

William D. Connor, vice president of IS at Motorola, Inc.'s General Systems Sector, said, "We definitely intend to manage LANs on a distributed basis, in line with the decentralized way that Motorola runs its businesses." On the other hand, IS wants to be able to "administer software centrally," as well as do centralized backup, Connor said.

American Centennial is "just starting to put some things in place, more to identify issues than to stop anyone from doing anything," Mahoney said.

A challenge is "creating guidelines that don't restrict the user's ability to do business" in key areas such as applications development, file creation and maintenance and access control, he added.

For instance, Mahoney said, "You can say 'no user can create more than 10M bytes of disk,' but what do you do when the user has to create that next byte?"

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# InterBase, Paradox link will extend Borland's LAN plans

BY CHRISTOPHER LINDQUIST
CW STAFF

SCOTTS VALLEY, Calif. — Borland International, Inc. plans to unveil tomorrow its first link between InterBase and Paradox databases, as well as the first piece in the developer's InterBase-centric server strategy.

Specifically, Borland will introduce the latest versions of its InterBase relational database server and Paradox SQL Link, according to the company.

Borland's goal for InterBase, which it acquired as part of its purchase of Ashton-Tate Corp. last year, is twofold. First, Borland wants to increase its rather small (about 10,000 units) presence in the Unix server arena. InterBase is already there, though primarily in technical environments. The company is also pursuing fresh ground in the burgeoning personal computer local-area network market.

The upgrades, Version 3.3 of InterBase and Paradox SQL Link for InterBase, will provide the recently released Paradox 4.0 with an avenue for connecting with the relational, server-based system.

InterBase 3.3 has an updated client interface for PCs as well as DOS and Microsoft Corp. Windows requesters supporting Transmission Control Protocol/Internet Protocol networks. Cobol and Fortran precompilers and drivers supporting multiple languages, including English, French and German, are included.

Paradox SQL Link for InterBase provides an interface for Paradox 4.0 to InterBase, including support for Query By Example and manipulation of binary large objects, such as images.

Borland is "really going after the server market for people on PCs who want to grow up," said consultant Judith R. Davis.

Integral to that pursuit is the idea of bringing more PC-like database interaction to the world of relational, server-based databases, including managing such things as file locking so that users can perform long queries without denying data access to other users. Such issues are complex, however, and Borland will have its hands full, according to analysts.

"You can't wave a magic wand and make the problems of learning about [both] SQL and server databases go away," said David McGoveran, president of Alternative Technologies in Boulder Creek, Calif. "Borland will have to face the fact that users will have to be told there are certain things they can't do," he said.

If Borland can accomplish its goal of an easy-to-operate client/server relational database, however, at least one user will be waiting eagerly. Rock Blanco, vice president of information systems at Garber Travel in Boston, said he has been looking to build a distributed database network and would love to have one ready to run out of the box. "If that's the case," he said, "I would go for it."

InterBase 3.3 and Paradox SQL Link for InterBase are both expected in the fourth quarter of 1992. SQL Link for InterBase has a list price of $395. Upgrades to InterBase 3.3 are free for existing customers.

*Senior West Coast editor Jean S. Bozman contributed to this report.*

> "YOU CAN'T WAVE a magic wand and make the problems of learning about [both] SQL and server databases go away."
>
> DAVID MCGOVERAN
> ALTERNATIVE TECHNOLOGIES

## CORRECTIONS

The story "CA's lineup" in the Desktop Computing section [CW, Aug. 17] should have indicated that the listed products are only a sampling of Computer Associates International, Inc.'s key personal computer products.

……

The interoffice connection charges listed for MCI Communications Corp. in the Aug. 3 Marketplace section were incorrect.

The correct mileage charges for distances from Boston to New York (185 miles) and New York to San Jose, Calif., (2,549 miles) are 56K bit/sec.: $285.50 to $994.70; 256K bit/sec.: $1,004.05 to $3,675.37; 768K bit/sec.: $2,401.10 to $9,162.14; and T1: $3,147.00 to $15,912.60.

……

A chart containing information about Frame Relay Service [CW, Aug. 31] inaccurately reported that Nynex would provide this service nationally, in Canada, Mexico and Europe.

Consistent with its legal obligation, Nynex provides intraLATA frame-relay service only within its region. Nynex does not have any plans to provide interLATA frame-relay service inside or outside of its region.

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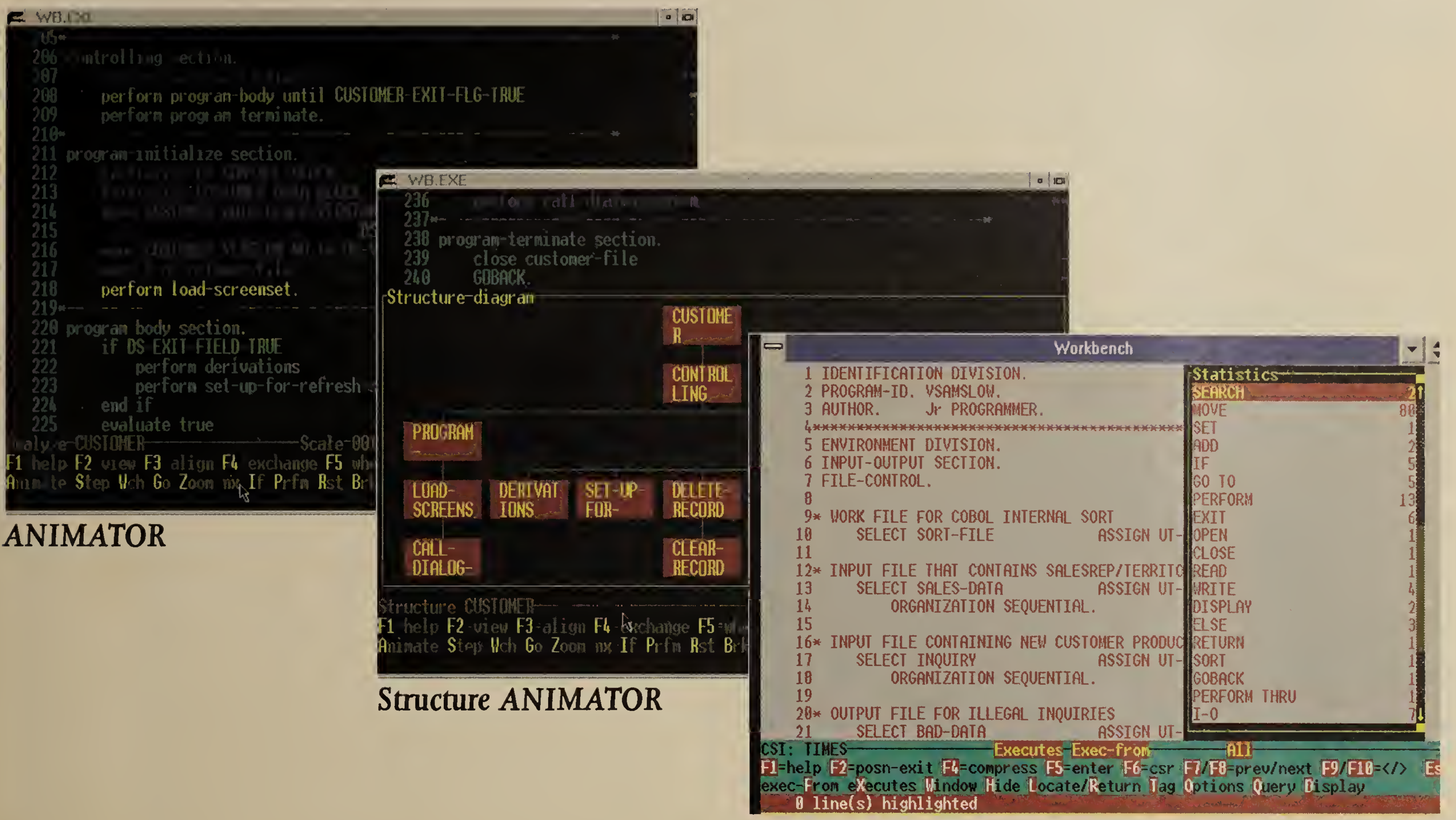

```
WB.EXE
*
controlling section.

    perform program-body until CUSTOMER-EXIT-FLG-TRUE
    perform program terminate.
*
program-initialize section.






    perform load-screenset.
*
program body section.
    if DS EXIT FIELD TRUE
        perform derivations
        perform set-up-for-refresh
    end if
    evaluate true
 alyze-CUSTOMER──────────Scale-00
F1 help F2 view F3 align F4 exchange F5 wh
Animate Step Wch Go Zoom mx If Prfm Rst Br
```

ANIMATOR

```
WB.EXE

*
program-terminate section.
    close customer-file
    GOBACK.
Structure-diagram
```

```
Structure CUSTOMER
F1 help F2 view F3 align F4 exchange F5 wh
Animate Step Wch Go Zoom mx If Prfm Rst Brk
```

Structure ANIMATOR

```
Workbench
 IDENTIFICATION DIVISION.                        Statistics
 PROGRAM-ID. VSAMSLOW.                           SEARCH          2
 AUTHOR.     Jr PROGRAMMER.                      MOVE           80
*********************************************    SET             1
 ENVIRONMENT DIVISION.                           ADD             2
 INPUT-OUTPUT SECTION.                           IF              5
 FILE-CONTROL.                                   GO TO           5
                                                 PERFORM        13
* WORK FILE FOR COBOL INTERNAL SORT              EXIT            6
     SELECT SORT-FILE              ASSIGN UT-    OPEN            1
                                                 CLOSE           1
* INPUT FILE THAT CONTAINS SALESREP/TERRITO      READ            1
     SELECT SALES-DATA             ASSIGN UT-    WRITE           4
         ORGANIZATION SEQUENTIAL.                DISPLAY         2
                                                 ELSE            3
* INPUT FILE CONTAINING NEW CUSTOMER PRODUC      RETURN          1
     SELECT INQUIRY                ASSIGN UT-    SORT            1
         ORGANIZATION SEQUENTIAL.                GOBACK          1
                                                 PERFORM THRU    1
* OUTPUT FILE FOR ILLEGAL INQUIRIES              I-O             7
     SELECT BAD-DATA               ASSIGN UT-
CSI: TIMES──────────────Executes Exec-from──────All
F1=help F2=posn-exit F4=compress F5=enter F6=csr F7/F8=prev/next F9/F10=</> Es
exec-From eXecutes Window Hide Locate/Return Tag Options Query Display
   0 line(s) highlighted
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# AS/400 users zero in on pricing

BY KIM S. NASH
CW STAFF

NEW YORK — Application System/400 users greeted IBM's new four-way processor and redundant arrays of inexpensive disks (RAID) subsystem last week with a ho-hum attitude. Although the new products piqued interest, most shops said processor and storage upgrades will wait until after the expected first-quarter 1993 debut of a new F series AS/400 line.

What really drew cheers was IBM's foray into user-based software pricing.

The reaction of Massachusetts Financial Service Center, Inc. to the new hardware was typical. Running a Model E70, the Boston-based financial firm has no immediate need for the new products, according to James Bailey, senior vice president. "But it's encouraging to see IBM expand the line. As our business grows, it won't outpace the platform," Bailey said.

### Hurrah for prices

By giving customers the option to pay per-user fees for some applications rather than traditional tiered pricing, IBM "is definitely onto something good," said Peggy Payne, information systems manager at Westinghouse Security Electronics in Santa Clara, Calif.

Promising more to come, IBM will experiment with the new price plan on two applications: ImagePlus, an imaging application; and PC Support, a program for linking AS/400s to personal computers. License management tools will be made available to third-party software makers in the hopes of spreading the user-based initiative.

A few vendors, such as Computer Associates International, Inc., have already gone this route. "If IBM's experiment goes well, the floodgates will open," said David Andrews, president of ADM Consulting, Inc. in Cheshire, Conn.

Sybron Chemical, Inc., an AS/400 Model D45 shop and maker of specialty chemicals in Birmingham, N.J., priced imaging software from IBM a couple of years ago but decided the cost was prohibitive.

The 150-user company went with PC-based imaging instead, said Jerry Goldman, director of MIS. "Pricing like this, though, would be easier to cost-justify," Goldman said.

### Server option

Per-user pricing could also better position the AS/400 as a server, which John Thompson, general manager of IBM's Application Business Systems unit, said is a key new target market for the line as it expands. Thompson said high-end AS/400s, including next year's F series machines, are aimed at large users and those looking to "rightsize" by moving applications off mainframes.

However, the price/performance of the line troubles some users. Pace Foods, Inc., for example, would rather buy two smaller systems than one expensive high-end model, said Charles Greene, member of the MIS division of the San Antonio-based food distributor.

Pace Foods bought a D10 last year for software development and a bar-code system and also runs a B70 for mainstream applications. The company is evaluating whether to replace the D10. "It's cheaper to buy two 40s than one 70," Greene said.

## New arrivals in IBM's midrange family

*IBM's additions to its AS/400 line include the following:*

- **E95 four-way processor.**
**Performance:** Boost of 20% over former top-end, three-way E90 model.
**Availability:** January 1993.
**Price:** $973,000, plus $190,000 for upgraded operating system.
- **9337 Disk Array Subsystems for 9406 D and E models** (two RAID-5 systems with up to 5.8G bytes of storage).
**Availability:** Nov. 13.
**Price:** $42,900 and $60,000, respectively.
- **Two low-end subsystems with up to 6.8G bytes storage.**
**Availability:** Sept. 25.
**Price:** $38,900 and $56,000, respectively.
- **InfoWindow II display terminals** (four models sporting dual-screen sessions, mouse support).
**Availability:** Sept. 25.
**Price:** $640 to $1,265, with one-year warranty.
- **AS/400 Support Family** (seven separate services).
Examples:

AS/400 Associate, a technical advocate assigned to learn customer shop; $250/machine per month.

Forum, bulletin board via Electronic Customer Support line; $25/machine per user per month.

PM400, performance tuning reports done by IBM; $165/shift coverage per month for monthly reports or $210/shift coverage per year for one set of reports.

# Apple announces DAL server to link AS/400, Macintosh

BY MICHELE DOSTERT
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc. last week announced a new Application System/400 Data Access Language (DAL) Server that will allow Macintoshes to transparently access SQL-standard data stored on IBM's AS/400.

The AS/400 link is the latest network-related announcement to come from the IBM/Apple alliance announced in July 1991. Earlier products tied the Macintosh into Systems Network Architecture, Token Ring and Transmission Control Protocol/Internet Protocol networks.

Apple's DAL is an SQL-standard-based connectivity language that allows Macintosh users to use the drag-and-drop Macintosh interface to import SQL data. The DAL programs translate Macintosh commands into SQL commands to access data stored on non-Macintosh platforms.

"The AS/400 product completes Apple's DAL product line," said Randy Hietter, data access product manager at Apple. He said Apple now has DAL servers for 14 midrange and mainframe operating systems and 14 different databases.

Some users who have mixed Macintosh and AS/400 environments are eager to try the new DAL Server when it ships. Gary Garver, the head of information systems at the American Legion in Indianapolis, has about 50 Macintoshes connected to AS/400s at various sites. He said, "Right now, we use PC support from IBM to connect the Macintoshes to the AS/400s." Typically, the AS/400 is used as a database machine; right now, there are not many Macintoshes connected to them. The DAL Server will help the Macintoshes link up in a palatable way.

"The trouble is, the Macintosh user then has to give up his beloved interface and emulate AS/400 commands — and he hates it. We will definitely look at this product when it comes out if it can shield our users from the AS/400 database interface," Garver said.

The DAL Server for the AS/400 is scheduled to ship in December. Apple said it is developing other Macintosh-to-AS/400 products, including 5250 terminal emulation software and a "Shared Folders" utility. Shared Folders will allow Macintosh users to mount the AS/400 file system as a Macintosh file system, thus letting Macintosh users easily store and retrieve data on the AS/400.

# Mac users to get tighter E-mail ties

BY MICHELE DOSTERT
CW STAFF

OLYMPIA, Wash. — Apple Computer, Inc. Macintosh users are not the only desktops getting IBM Application System/400 connectivity. Developer Patrick Townsend and Associates has enhanced its T/Mail MHS product to provide AS/400 mail connectivity with Banyan Systems, Inc.'s Vines and with Novell, Inc.'s NetWare network operating system.

T/Mail MHS runs on the AS/400; it can provide either mail services to AS/400 users or a gateway into IBM's OfficeVision/400 mail services.

From the AS/400, T/Mail MHS then connects to a bridge personal computer running MHS, which connects to any NetWare electronic-mail package that supports Novell's MHS message handling software.

T/Mail MHS can now offer AS/400 mail access to Vines users and vice versa by making the Vines and AS/400 E-mail systems speak a common language — MHS.

T/Mail bridges from the AS/400 side to the MHS-running PC.

A product called V-Bridge/MHS from Computer Mail Services, Inc. in Southfield, Mich., then bridges from Vines' mail service into the MHS-running PC.

T/Mail MHS also provides Banyan StreetTalk directory support on the AS/400.

# Ameritech agrees to install local-loop fiber-optic cables

BY ELLIS BOOKER
CW STAFF

CHICAGO — Ameritech Corp. last week said it had negotiated two contracts that make up the largest committed purchase of local-loop, fiber-optic cables and related electronics in telecommunications history.

Ameritech's investment under the two contracts, including installation of fiber lines and support electronics, will total just under $1 billion. The deployment will also triple the amount of local-loop fiber in Ameritech's five-state region.

Ameritech will buy Fiber to the Curb equipment from DSC Communications Corp. in Plano, Texas, and Raynet Corp. in Menlo Park, Calif. DSC will also supply Next Generation Digital Loop Carrier systems, and Raynet will provide its multivendor operation support system, Rides.

The value of the individual deals was not disclosed, but company sources said DSC won the lion's share of the contract. DSC and Raynet won out over seven other firms responding to a request for proposals issued in July.

"These [purchases] are part of our planned network upgrade, built into our existing and future capital budget plans," a company spokesman said. Buying the fiber and electronics in bulk, he added, brought the cost of the fiber down to that of copper cable.

Within the next two years, fiber in the local loop, or the "last mile" portion of the phone network, will be a "routine" deployment, said Beacher Pearce, manager of network programs at ElectroniCast Corp., a market research firm in San Mateo, Calif, specializing in electronic and optoelectronic industries.

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# New Jersey Bell dials up pen systems

BY MICHAEL FITZGERALD
CW STAFF

NEWARK, N.J. — Potentially providing a shot in the arm for the fledgling pen-based industry, New Jersey Bell Telephone Co. last week bought 300 NCR Corp. 3125 notepads as part of a $3.3 million client/server project.

The potential impact could be much larger, as New Jersey Bell is "acting as a test bed for all of [parent company] Bell Atlantic Corp.," said David Young, assistant manager of distribution services systems at New Jersey Bell. He said the notepad and Unix server project was approved "at the highest level of Bell Atlantic."

New Jersey Bell is implementing an entirely new data processing infrastructure in its operations offices. Besides the 3125s, it bought 12 StarServer E multiprocessor servers and 76 Model 3345 servers from NCR. The StarServer ES servers will be used as Unix servers for local-area networks in New Jersey Bell administrative offices, linkingstand-alone personal computers. Meanwhile, the 33-MHz 486-based Model 3345s will serve the same purpose in New Jersey Bell's garages, with X Window System terminals connected to them. Each StarServer will also be linked remotely to four or five 3345s.

New Jersey Bell is moving to client/server computing to decrease paperwork and gain operational efficiencies. Under its old, paper-intensive system, data compiled by New Jersey Bell's supervisors would be typed into spreadsheets and sent to the corporate staff for further review.

Now it will be uploaded via modem to the 3345s, then automatically sent into an Informix Corp. SQL database on the StarServers. Information for the supervisors will be sent to them transparently as they log on.

Young said the workers previously dedicated to typing in data will now work in customer service. "Those people are much more productive if they're serving customers directly," he noted.

Anton Kurelja, manager of distribution services systems at New Jersey Bell, cited efficiency as the driving force behind buying the 3125s. Because the company lost roughly 570 field managers last year to an early retirement program, the remaining managers have had to handle more work.

Staff "downsizing takes place, and we have to figure out how to accommodate what we did before with fewer people," Kurelja said. He said managers who were responsible for seven employees now have to handle up to 15. "The economies are obvious."

New Jersey Bell worked with Windsoft, Inc., a Denville, N.J.-based value-added reseller, to design 12 electronic forms, condensed down from perhaps triple that number of paper forms. Windsoft also designed a blank form for note-taking and several personal productivity tools.

The development work was done under Grid Systems Corp.'s PenRight operating environment, which runs over DOS and is licensed by NCR.

Young said the move to pen-based systems started two years ago. New Jersey Bell spent two years experimenting with Intel Corp. 8088-class pen systems from Grid Systems, then decided to wait for the performance boost offered by the 80386SL-based 3125.

After many product delays because of Federal Communications Commission clearance issues and NCR's slow ramp-up, the products are in-house.

Young said he would have liked to wait for NCR's 3130 notepad, which corrects the 3125's main flaws, "but we had to deploy; we couldn't wait anymore. We see this as a beginning, and as new hardware becomes available we'll evaluate it."

# Users want action from IBM personal computer unit

CONTINUED FROM PAGE 1

for its agents for the first time since the company formulated the list because the last two such products — IBM's Personal System/2 Model 70 and L40SX laptop — were no longer competitive in price/performance.

"In some ways, their [upcoming] product announcements are more important. This reorganization just shows all the trouble they're in," agreed William Bluestein, an analyst at Forrester Research, Inc. in Cambridge, Mass., referring to an expected revamp of IBM's entire PC product line.

Several users said a break from the mainframe-dominated mind-set at IBM would improve PC service and support and make pricing concessions easier to gain. Tom Martin, director of computer services at Conyers, Ga.-based Lithonia Lighting, said he thought it would make concessions granted faster.

Before, it was difficult "because too many people had to say yes. Now, if they so choose, they can be more immediate. It gives them a better handle on cost benefits," he said.

Corrigan said that in IBM's upcoming product announcements, expected on Sept. 9 and 21, the hardware unit will follow OS/2's lead by branching into new distribution channels.

The company will initially sell through various channels, including its traditional dealer network, and will contract with IBM's sales force to sell its wares, too. IBM retains the Personal Systems Programming Division (OS/2) and Advanced Workstations Division (RISC System/6000), as well as its Technology Products Group. Corrigan reports to IBM Vice President James A. Cannavino, general manager of the Personal Systems Division.

Corrigan will have profit-and-loss responsibility, but the company's results will not be reported separately from IBM's. Corrigan claimed that creating a separate PC company would allow the unit to better control its pricing, features and components sourcing.

### Checkered past

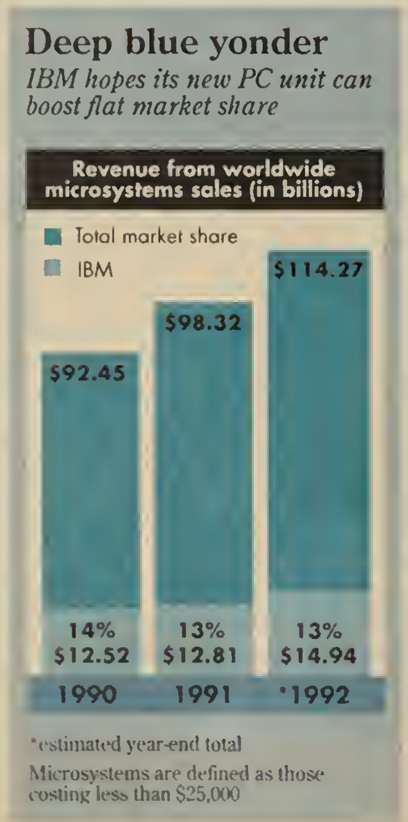
IBM has a mixed history in efforts to revitalize business units by seceding them from the Big Blue union. While its Lexmark International, Inc. printer and Integrated Systems Solutions Corp. subsidiaries thrive, its Desktop Software Unit was dismantled before it had a chance to get off the ground.

Some observers wondered how a supposedly separate organization populated by people steeped in IBM culture could succeed. "With all the same people in place, can we really expect an entrepreneurial spirit to surface from thin air?" asked Richard Zwetchkenbaum, an analyst at Framingham, Mass.-based International Data Corp.

Many users interviewed by *Computerworld* said that while IBM was taking necessary steps to be more flexible and competitive by spinning off the company, they would not be convinced until they saw tangible evidence.

"We need to wait and see how it is implemented," said Lynne Baron, director of systems and technology at Standard & Poor's, Inc. Baron has shifted from IBM largely because of price, but she said proper service and support are also vital. "If IBM can lower prices to be competitive and still achieve the level of service and support of a Dell, that might be something we would revisit," she said.

Sources close to IBM said pricing on the new lines of PCs will be very aggressive, although it is unclear whether they will undercut clones.


**Deep blue yonder**

*IBM hopes its new PC unit can boost flat market share*

*estimated year-end total

Microsystems are defined as those costing less than $25,000

Source: Computer Intelligence/Infocorp

## Industry sound bites

**William Tauscher**, *chairman and chief executive officer at ComputerLand Corp.:*

"It's been a long time coming, and I think it's wonderful. Basically, you had a structure that had two product organizations [ESD and NDD]. It was potentially ripe both for slow decision-making and . . . incorrect decision-making."

**Scott McNealy**, *chairman of Sun Microsystems, Inc.:*

"If IBM is successful in creating a more competitive Intel product line, the big winners will not be IBM but will be Intel and Microsoft. So to me, it's a totally wasted effort on IBM's part, unless it's a strategy to jettison a limb that works entirely for Bill Gates."

# IBM, Canon build notebook with printer

BY DAVID KELLAR
IDG NEWS SERVICE

TOKYO — IBM and Canon, Inc. said last week they will develop a notebook PC with a built-in bubble-jet printer as part of a joint venture to develop what the two called "next-generation personal computers."

The project will combine IBM's notebook efforts with Canon's microhead, bubble-jet technology in an integrated unit that will be the size of a conventional notebook PC, a Canon official in Japan said. U.S. sources said the prototypes are closer in size to a laptop, with the printer integrated onto its back.

The IBM/Canon notebooks are expected to be introduced first in Japan. The companies said the new notebooks will appear sometime next year. Some observers pegged a release date of as early as next spring.

"I think it's a good idea because a certain percentage of notebook [users] are totally field-based, and sometimes you just need to print something out," said Richard Zwetchkenbaum, an analyst at International Data Corp. in Framingham, Mass. He said Wang Laboratories, Inc. unsuccessfully marketed a similar concept several years ago.

### Lighter is better

Information systems managers with field users said the idea might prove to be a good one.

"We haven't typically been interested in IBM notebooks, but anything that decreases the amount of equipment our salespeople have to carry is an interesting concept," said Robert Peterson, director of sales and marketing ISat Coors Brewing Co. in Golden, Colo.

Officials at IBM Japan and Canon declined to provide details of their product plans, but a Canon official said the venture will cover various areas of notebook technology. Both firms will sell the product under their respective brand names, he said.

One U.S. source said the product announcement has been delayed in the U.S. as IBM prepared its new IBM Personal Computer Co. (see story page 1).

IBM's agreement with Canon is the latest in a series of cooperative ventures. An IBM Japan spokesman said the company continues to "pursue joint development in areas where other companies have superior technology in order to better meet user needs."

*Senior writer Michael Fitzgerald contributed to this report.*

# Cisco offers APPN option

CONTINUED FROM PAGE 1

"APPI is essentially a way to do peer-to-peer SNA networking without solely relying on APPN products from IBM and the friends they choose to license the software to," noted Nick Lippis, president of Strategic Networks, Inc., a consultancy in Rockland, Mass.

APPI allows users to interconnect APPN End Nodes over their existing Transmission Control Protocol/Internet Protocol (TCP/IP) backbones without having to implement the complexities of APPN Network Node on their routers. APPI combines IP routing and addressing with directory protocols and software that can intelligently handle SNA packets.

> APPI IS AIMED at the plethora of commercial customers running both Systems Network Architecture and LAN internetworks.

A systems manager at a large New York financial services firm, who asked not to be identified, was bullish on the concept. "To the extent that we'll be doing APPN, we'll be doing it this way," he said. His firm runs a large IP backbone. "The fewer protocols in the backbone, the better," he said.

Robin Layland, engineering consultant at The Travelers Corp. in Hartford, Conn., added: "Using IP routing instead of native APPN is positive in that it reduces the number of protocols on the network. This has the benefit of less network overhead and of letting users of different protocols receive the same levels of service."

## The public interest

APPI is billed as a public-domain specification available free of charge to vendors that want to implement it on their internetworking gear. Among the vendors that have endorsed APPI are BT, Infonet Computer Sciences Corp., Cabletron Systems, Inc. and McData Corp.

Not all vendors are jumping on the APPI bandwagon. APPI "is just another proprietary announcement," said Lynn Nye, a spokesman for LAN gateway vendor Sync Research, Inc. "Like the SNA product Cisco started to announce last year, this will be another attempt to implement their version of APPN when they don't have a grasp of what they're getting into."

Digital Equipment Corp. said it would consider APPI as one way to implement SNA support on its high-end router, the DECnetwork Integration Server.

"Cisco is making a big bid here to cut IBM off at the pass with its own approach," said Janet L. Hyland, director of network strategy research at Forrester Research, Inc., a consultancy in Cambridge, Mass., that "isn't crazy about APPI."

Cisco's offering presumes an IP backbone, she pointed out, and that "users will view APPN wrapped inside of TCP/IP as better than native APPN."

Rick Villars, an analyst at International Data Corp. (IDC), said, "Directly challenging a strategic technology for IBM is an audacious move." However, he said, when IBM announced its APPN strategy in March 1992, IDC believed that many IBM customers would have preferred APPN to be built on top of TCP/IP "instead of being positioned as a direct alternative."

That is because an IDC survey of 200 mainframe sites revealed that more than 20% stated TCP/IP would be critical to their network plans, while slightly less than 5% said APPN would be.

Cisco gear will support APPN — a routable protocol — as well, but not until the first quarter of 1994.

Whether IBM will support APPI on its still-to-ship 6611 multiprotocol router is a question mark; IBM said it just learned of APPI this week.

"We're looking at it and trying to understand what it is," an IBM spokeswoman said. "It looks interesting, but we don't know enough yet to comment."

Cisco's main competitor, Wellfleet Communications, Inc., declined to comment.

*Senior editor Elisabeth Horwitt contributed to this report.*

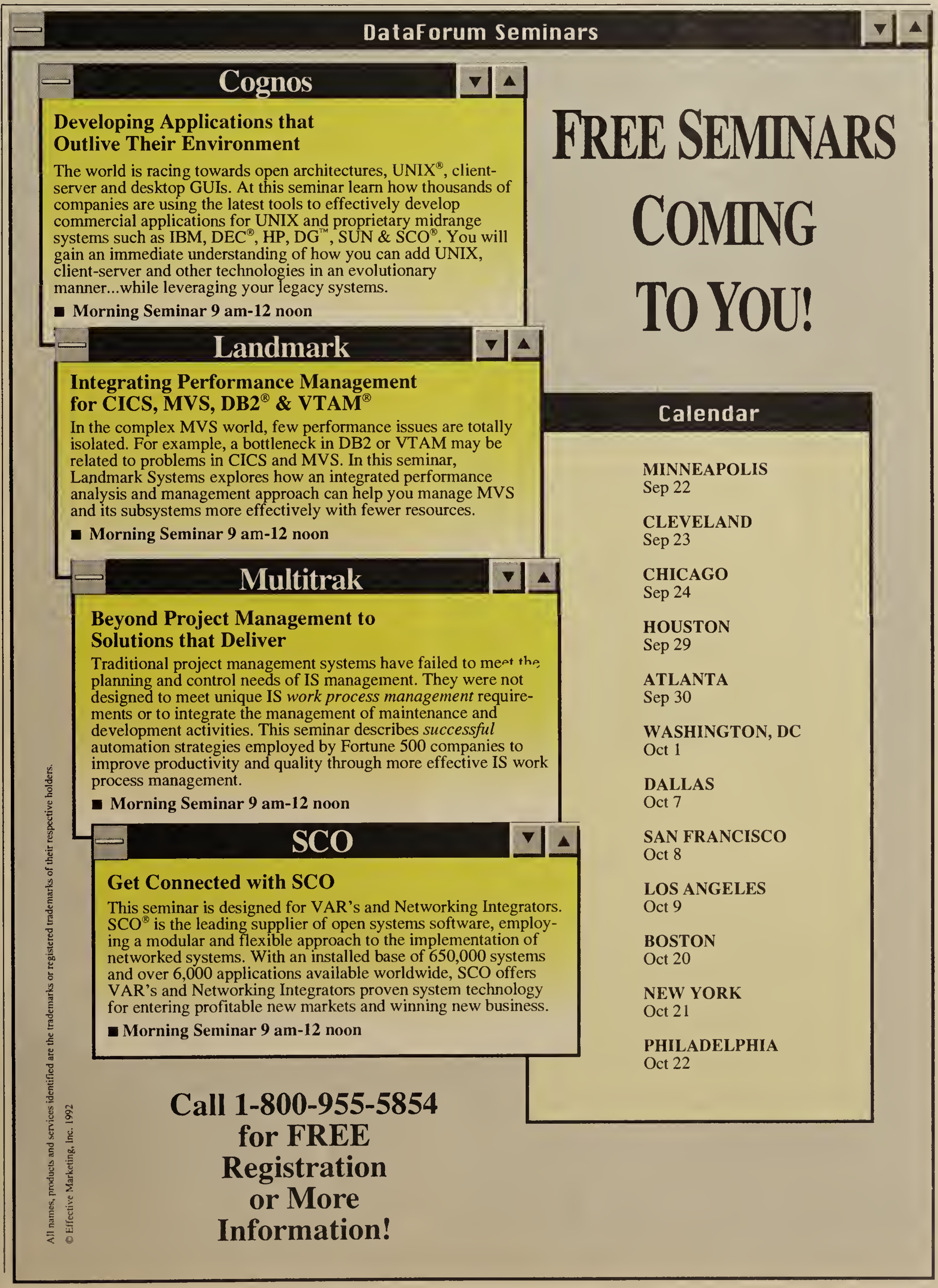
### Open SNA

*Cisco's open APPN announcement adds another option to these alternatives for melding IBM networks with LAN internetworks:*

- **Running separate SNA and LAN networks while either building a routable APPN backbone out of SNA or letting the SNA network die off.**
- **Using existing source-route bridging or routing SNA packets encapsulated in other protocols.**
- **Running IP over SNA backbone.**
- **Running IBM peer-to-peer networking over existing IP backbone with Cisco APPI or using some combination of APPI/APPN.***

*Announced this week

CW Chart: Michael Siggins



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# NEWS SHORTS

## SNA gets flatter

Two router vendors last week alleviated barriers to carrying IBM Systems Network Architecture (SNA) traffic over local-area networks. Alongside its industry-rattling announcement that it has developed an alternative to IBM's Advanced Peer-to-Peer Networking approach (see story page 1), Cisco Systems, Inc. followed through on Phase IV of its five-phase IBM internetworking plan, initiated in 1989. Phase IV emphasizes prioritizing SNA traffic over LAN internetworks to increase response time. CrossComm Corp. last week delivered a similar capability.

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## Wang talks Chapter 11 with users

Eighteen members of the U.S. Society of Wang Users recently met with officials from Wang Laboratories, Inc. to discuss the effects of its recent Chapter 11 filing on the user base. Joe Tucci, newly promoted executive vice president of operations, promised customers continued service from trained customer engineers. Wang's proposed plan to lay off 5,000 of its 13,000 workers was detailed to the group.

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## Let your keyboard do the walking

Electric Bookshelf, Inc. in Norcross, Ga., is giving away the Employers on Disk database of 10,000 employers. The package, normally priced at about $149, has the addresses of employers in 12 major U.S. cities, as well as a program that lets a user browse through the database, add contact names and print mailing labels.

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## Navy buys Intergraph gear

Intergraph Corp. in Huntsville, Ala., won a $422 million contract to supply interactive computer graphics systems and services to the U.S. Navy. Part of the Navy's $1.5 billion CAD-2 program, the procurement includes up to 4,200 workstations, 1,082 servers and 500,000 hours of support services. Intergraph beat teams led by Centel Federal Systems and Federal Computer Corp. for the job, the largest federal procurement ever of computer-aided design technology.

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## AT&T picks up encryption tools

AT&T's Secure Communications Systems Division last week acquired public-key cryptography licenses from Public Key Partners through which it will develop devices for secure voice, data, fax, cellular and video communications. The licenses will give AT&T access to all forms of public-key. Greensboro, N.C.-based Public Key Partners holds the exclusive licensing rights to the Stanford University and MIT patents covering public-key cryptography. Neither the terms nor the financial value of the deal were discussed.

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## Short takes

Peter B. Sheridan, a 40-year **IBM** research veteran and a member of the IBM team that developed the Fortran language during the mid-1950s, died on Aug. 25 of pancreatic cancer. . . . **Computer Sciences Corp.** (CSC) will receive a small slice estimated at $3 million annually of a $39.7 million asset management contract awarded last week by the **Resolution Trust Corp.** to **Texas Data Control.** CSC's CSC Logic subsidiary will provide data processing through a Resolution Trust data center and will also provide project management, report distribution and training. . . .The **Communications Managers Association** (CMA) and the **Association of Data Communications Users** will merge under the CMA banner. . . . **Next, Inc.** shipped NextStep 3.0, which features client support for **Novell, Inc.** NetWare and **Apple Computer, Inc.** AppleShare, object programming tools, a database development tool and Integrated Services Digital Network. . . .The **Petrotechnical Open Software Corp.**, a consortium of oil companies that works to define software standards, will study two object-oriented database packages — **Hewlett-Packard Co.**'s OpenODB and **UniSQL, Inc.**'s UniSQL/X — as elements of a unified method to manage data from multiple computer systems. **Microsoft Corp.** has extended the reach of its Visual Basic development language to MS-DOS.

# NetWare, host integration elusive

CONTINUED FROM PAGE 1

networks to their IBM mainframes via third-party gateways; however, implementing these gateways can be tricky because both must be configured correctly, and problems are hard to troubleshoot.

Gateway user Jeff Cagel, a systems programmer at Ryan Aeronautical Division of Teledyne, Inc. in San Diego, explained, "SNA and NetWare are both two closed, proprietary systems." And engineers who really understand both NetWare and Systems Network Architecture are rare, so one side of the connection usually poses problems.

Gateways and terminal emulation are a long way from what is usually defined as interoperability — allowing host and LAN-based applications to use either platform and share data. First, common communications application programming interfaces (APIs) must be implemented on both platforms.

### One step at a time

Some progress has been made. Both Novell and IBM will support the vendor-independent messaging standard. And, according to IBM, both companies are committed to supporting IBM's Common Programming Interface for Communications on NetWare servers. But applications written for an IBM platform still do not commonly run on NetWare LANs.

A good starting point, according to Craig Burton, president of the Salt Lake City-based research firm Burton Group, would be for IBM to build a NetWare Loadable Module that could translate its Server Message Block calls for NetWare. "We haven't heard anything about such a product from either IBM or Novell," he said.

Once a link is made, users want to monitor and manage both mainframes and LANs from one centralized location. Rod Peterson, operations specialist manager at Raychem Corp., a manufacturing company in Menlo Park, Calif., said, "I want to be able to monitor those remote LANs via the mainframe and provide LAN backup and recovery services from our central mainframe shop."

Some said they think IBM could do more to ease NetWare connectivity issues. "IBM seems to pass on a lot of decision-making to the customer rather than building more intelligence into the software," said Thomas Rianhard, a systems officer at Centerbank in Waterbury, Conn.

"You have to make the same parameter choices in about 20 different places. If you enter one wrong, the stuff won't work. The puzzle doesn't need to be that intricate," he said.

Several users said they were solving integration problems by throwing away their mainframes. Ken Stickney, LAN and communications manager for the city of Glendale, Calif., said, "Now we use gateways between our Novell LANs and our mainframe, but within a year and a half, we'll be completely off the mainframe. We're replacing it with Unix workstations."

An information systems manager at a Connecticut manufacturer said, "As soon as we can find a LAN payroll system we like, we're turning the mainframe off."

To avoid such moves, IBM is working to get its integration products out the door.

Bob Roth, who manages the Novell/IBM relationship for IBM's Networking Systems Division, claimed IBM has worked closely with Novell on the remote management of NetWare environments from IBM hosts. IBM is also working with Novell to enable NetView to remotely control NetWare servers.

"Secondly, in terms of applications developments, we are working with Novell to ensure that we both support the same APIs. Thirdly, IBM is now developing the NetWare drivers for our Token Ring, Media Access Unit and bridge products. Of course, there's no magic wand that so totally integrates them that there are no seams between the products, but the customers we've talked to have been appreciative," Roth said.

## Confusion in LAN Server land

The fact that IBM has been selling an IBM-labeled version of Novell's NetWare since February 1991, combined with Microsoft Corp.'s plans to move LAN Manager to its New Technology (NT) platform, has left users confused about IBM's plans for its LAN Manager-based OS/2 LAN Server.

"LAN Server is an integral part of IBM's distributed computing strategy. We have plans in place for follow-on releases of LAN Server," said Joe Demassa, IBM's manager of LAN Systems Marketing in the Personal Systems Group.

"I think people expected that IBM would give up on LAN Server and go with NetWare, and they haven't, so the LAN Server users I talk to are confused," said Cheryl Currid at Currid and Co., a consultancy in Houston.

And while IBM has been preoccupied with the desktop wars, Novell's development of NetWare on IBM platforms has proceeded full speed.

According to Bob Young, director of marketing at Novell's NetWare Products Division, the vendor will have versions of NetWare for the RISC System/6000 and NetWare for OS/2 out shortly after the late 1992 release of NetWare 4.0. "Most of the actual development is being done by Novell; IBM's contribution is support for us on their platform," he said.

Despite user confusion and Novell's aggressive drive, IBM is making it clear that LAN Server is its LAN platform of choice. Demassa defined IBM's LAN operating system strategy thusly:

"What we're telling our customers is that for the traditional workgroup, where you just want file and print services or you need an application that runs on NetWare, Novell is a fine solution. For the customers that are looking to build custom corporate applications on the LAN, we think OS/2 and OS/2-based LAN Server is the right platform."

NetWare for OS/2, expected in early 1993, will not be a viable approach, according to IBM, because it runs as a process on top of OS/2 rather than being integrated with OS/2 like LAN Server.

Demassa also addressed Microsoft's announcement that NT will be its primary development platform for future LAN Manager versions. "LAN Server and LAN Manager have diverged and will continue to diverge. We will be adding features to LAN Server similar to those found in LAN Manager 2.1, plus some extra features of our own, but we will do the development ourselves."

Although OS/2 Extended Edition provides some connectivity, IBM said that for a true client/server LAN, users should buy LAN Server for the administration, management, file and security services that are found only in a LAN operating system.

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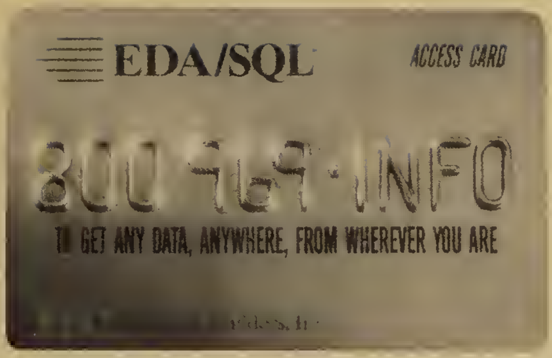

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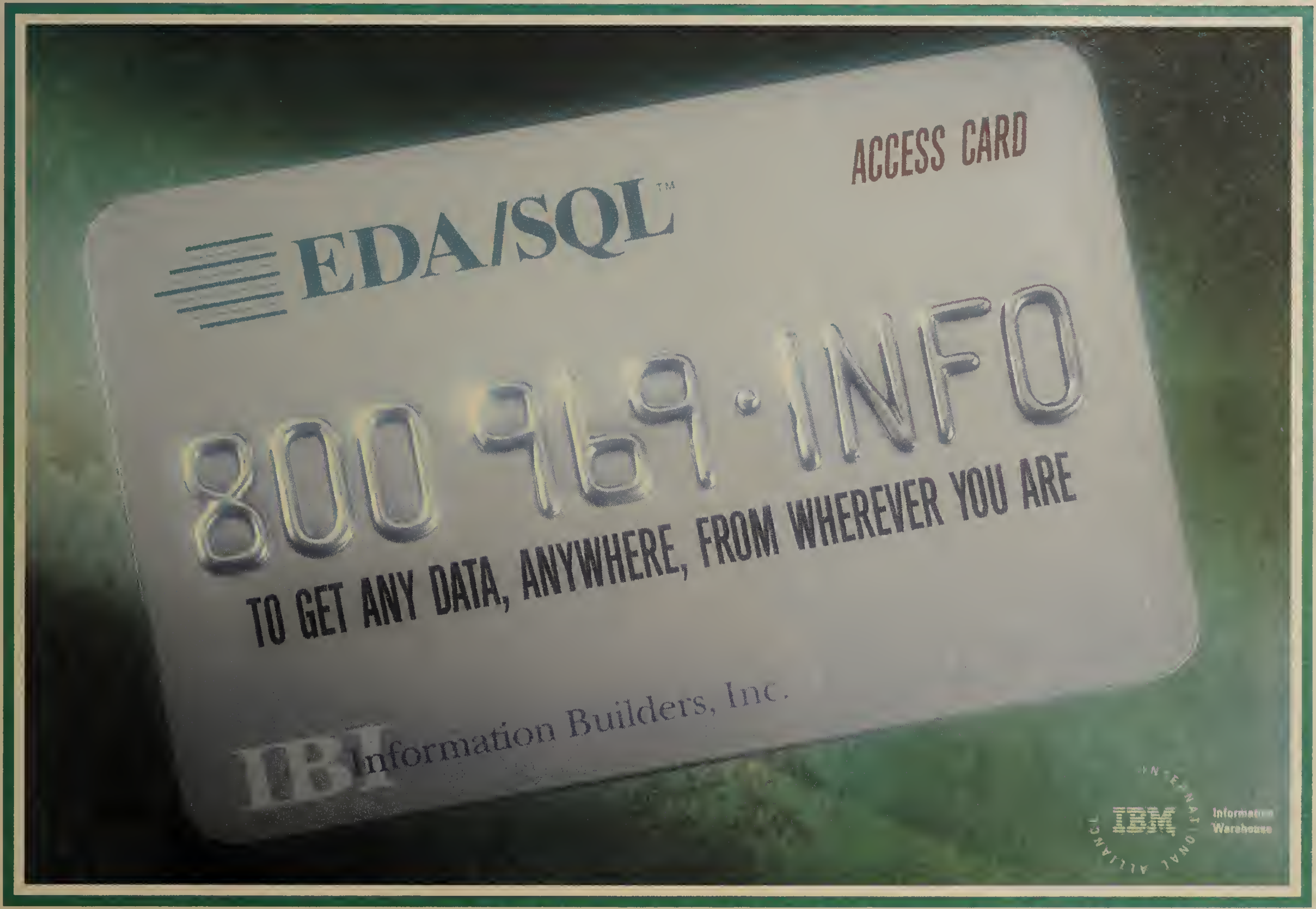
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# IS staff members consider the union label

CONTINUED FROM PAGE 1

In most cases, the percentage of IS staff members who are union members varies from 4% to 10%. But some labor experts said that is a historical low-water mark that should increase through the late 1990s.

"Our research shows a resurgence of unionism, following a period of decline since the 1970s," said Gerald Celente, director of the Trends Research Institute in Rhinebeck, N.Y.

In the U.S. work force, union membership stands at about 15%, said Daniel Cornfield, associate professor of sociology at Vanderbilt University in Nashville.

But in some parts of the economy, union membership runs as high as 40% — and often spills over into IS shops.

Burlington Northern Railroad in St. Paul, Minn., has 50 IS employees in the Transportation Communications Union, while hundreds in the 2,000-employee Massachusetts job agency belong to a government workers' union.

Traditionally, programmers and systems analysts styled themselves as technical warriors who were immune to automation, labor experts said.

"A lot of computer professionals always thought they had unique skills that would protect them," said Elaine Bernard, executive director of Harvard University's trade union program. "But they are no different than any other set of skilled workers."

Now that the work force is being squeezed in the middle, the skill set required to retain many IS jobs is changing, she said. For example, there is a surplus of mainframe jockeys in the market, in part becaue of IS layoffs that have followed data center consolidations, corporate mergers and bankruptcies [CW, Aug. 24.]

The formation of unions cannot stop technological change, but it can alter the way rapid change is handled within an organization, users said.

Unions "encourage dialog between management and the employees," said Jorge Quintero, assistant director of computer systems for the city of Miami, who directs centralized computer operations.

Miami had just 10 unionized computer operators until 1991, when union negotiators from the American Federation of State, County and Municipal Employees traded 4% salary increases for the right to organize more city workers. Now, 45 IS staffers belong to the union.

Despite the growth of some unions in IS shops, unionism has not been widely accepted since the Reagan administration downplayed its importance in the 1980s, experts said.

Resistance from some IS employees is one reason union membership is voluntary at sites such as Nebraska's state data center (see story above). "Many workers are scared to unionize because they don't have the full backing of the law," Cornfield said.

"A lot of shops have fought the union situation by reclassifying their staff as full-time workers not covered by the union contract, rather than as hourly workers," said Arnold Farber, president of Farber/LaChance, Inc. in Richmond, Va.

Some IS managers wince at the thought that unionization could ever come to their data center. It nearly happened at Crittendon Hospital, a highly unionized 300-bed medical facility in Rochester, Mich., in the mid-1980s. "There was a drive to unionize, and the organizers got enough signatures to have an election," said Robert Dinges, IS director of a staff of 13. "We had an active campaign against it."

The union lost the vote at Crittendon, but management changes were quickly made.

Dinges said he was relieved that unionization did not take hold: "Unions tend to be regimented, and IS tends to be free-flowing," he noted. "In the computer business, you never know when there's going to be overtime or when someone's going to have to come in to work."

## Union plants IS seed corn

Two years ago, a new union shop for IS was born at Nebraska's Central Data Center when employees elected a Nebraska Association of Public Employees (NAPE) bargaining unit.

The Central Data Center houses an IBM Enterprise System/9000 Model 720 and has about 300 IS staff members, half of whom are union members. Membership is not mandatory, but those who defer membership are lobbied.

"If they're turned off by the idea of the union, I back off," said Jeff Duhaime, a computer operator who is Local 61's union steward. The dues run to 1% of an employee's wages.

Some members of Local 61 feel they have benefited from standardized work rules and collective bargaining for wages, formal job postings and grievance procedures.

The union advocates employees' concerns, but it cannot veto changes in working conditions.

Union members can request a meeting with management, as some did recently when their hours were changed. "As long as the union is standing behind them, employees will not be left behind in technical training," Duhaime said. "If layoffs ever come, there are bumping rights so that the most senior people will be the last ones to go." However, the state-endorsed union does not support the right to strike.

State legislation allowed Nebraska employees to become unionized in 1969 and to bargain collectively for the wages of administrative workers in 1987, said Bill Arfmann, executive director of NAPE/AFSCME Local 61. The union covers 2,000 state employees.

JEAN S. BOZMAN

# Insurer taps EDS in switch back to centralized processing

BY MARK HALPER
CW STAFF

SANTA MONICA, Calif. — Fremont General Corp., a large insurance company that had intended just to sample an appetizer from Electronic Data System Corp.'s services menu, has instead selected a 10-year outsourcing entree.

The insurance company has tapped EDS to take over all data processing for its main subsidiary, Fremont Pacific Insurance Group, a $425 million workers' compensation operation.

The contract grew from a distributed computing job for which Fremont hired EDS last January, according to Fremont's chief financial officer, Wayne Bailey.

Under the original plan, EDS was combining the computer operations of Fremont Pacific's three units — Fremont Compensation Insurance Co., Pacific Compensation Insurance Co. and Beaver Insurance Co. — into one distributed system based on a Sun Microsystems, Inc. platform, Bailey said. The units were operating on a hodgepodge of systems, including an IBM mainframe and a Sun server.

But Fremont determined that the project would take too long — 2½ years — and cost too much, Bailey said.

The outsourcing job entails a mainframe-based hierarchical system, Bailey noted. "We reversed field. We're going to a mainframe now," he said.

Neither Fremont nor EDS would reveal the size of the contract, but Bailey estimated Fremont will save about $5 million in the first two years.

"The big thing will be the next couple of years," he said.

Although EDS offered jobs to Fremont's information systems staff, Bailey said he was not sure how many of the approximately 60 staff members took EDS' offer.

### Riding the waves

Besides cost savings, Fremont's outsourcing decision was motivated by a desire to concentrate on the company's core business, which in California is riding a sea of changes related to changing workers' compensation regulations.

"We wanted our management to focus on workers' compensation issues, not on computer systems," Bailey said. Proposed changes in the workers' compensation business include switching to competitive premium pricing from a minimum premium pricing system.

Bailey noted that offloading data processing onto EDS will also give Fremont greater flexibility to absorb the computer operations of companies it acquires.

# Ask Unix manufacturing suite debuts

BY JEAN S. BOZMAN
CW STAFF

MOUNTAIN VIEW, Calif. — The Ask Cos. is slated to introduce its Manman/X manufacturing applications for Unix client/server systems this week and ship them to users by November.

But the firm said last week that Manman/X, a package developed by a Dutch firm and adapted for Ask's Ingres relational database management system, will be ported to other vendors' databases by 1994. Ask acquired the Ingres relational technology when it purchased Ingres Corp. in 1990.

The introduction underlines the failure of $432 million Ask to port its own Manman manufacturing suite to the Ingres RDBMS in time to field a Unix client/server product by the fall. Ask decided last summer to license a 27-module program suite from the Dutch firm Baan International NV to compete at global sites that favor Unix [CW, July 20].

Ask said last week that versions for other SQL-based RDBMSs would be available in 12 to 18 months for customers who do not wish to use Ingres.

### Gaining an edge

"We did change our plans as we went along," Peter West, Ask's vice president of marketing, told *Computerworld* last week. "But by taking the steps we took, we think we will have 12 to 24 months' advantage over our competitors," he said, referring to Oracle Corp. and SAP AG.

Analysts noted that Oracle's manufacturing applications for Unix database servers are starting to ship in volume and that SAP's real-time manufacturing resource planning systems will start to ship in the U.S. this fall.

West said Ask's Advance, a two-year project to port Manman to Ingres, is still alive, at least for the initial general-ledger accounting package. The Advance package was pulled back from field testing for rework last spring. "Ask's ideals [for Advance] were so high they never got there," said Ted Rybeck, director of research at Advanced Manufacturing Research, Inc. in Boston.

Some beta-test users of Manman/X seemed not to mind Ask's change in plans. "If I had seen Advance coming in the near future, it would have been a viable option," said Steve Greiner, manager of information systems at Industrial Dynamics Co. in Torrance, Calif. "But we were outgrowing our system and felt we couldn't go into the new year without buying new hardware."

The 325-employee firm is replacing an aging 5 million instructions per second (MIPS) Hewlett-Packard Co. HP 3000 that ran Manman with a Unix-based 75-MIPS HP 9000 that will run Ingres-based Manman/X by December.

The initial release of Manman/X will support Unix systems from Digital Equipment Corp., HP and IBM. It has a built-in tool set that can be used to customize applications. Pricing will be based on the number of users, ranging from $25,000 for an eight-user system to more than $250,000 for a 128-user system.

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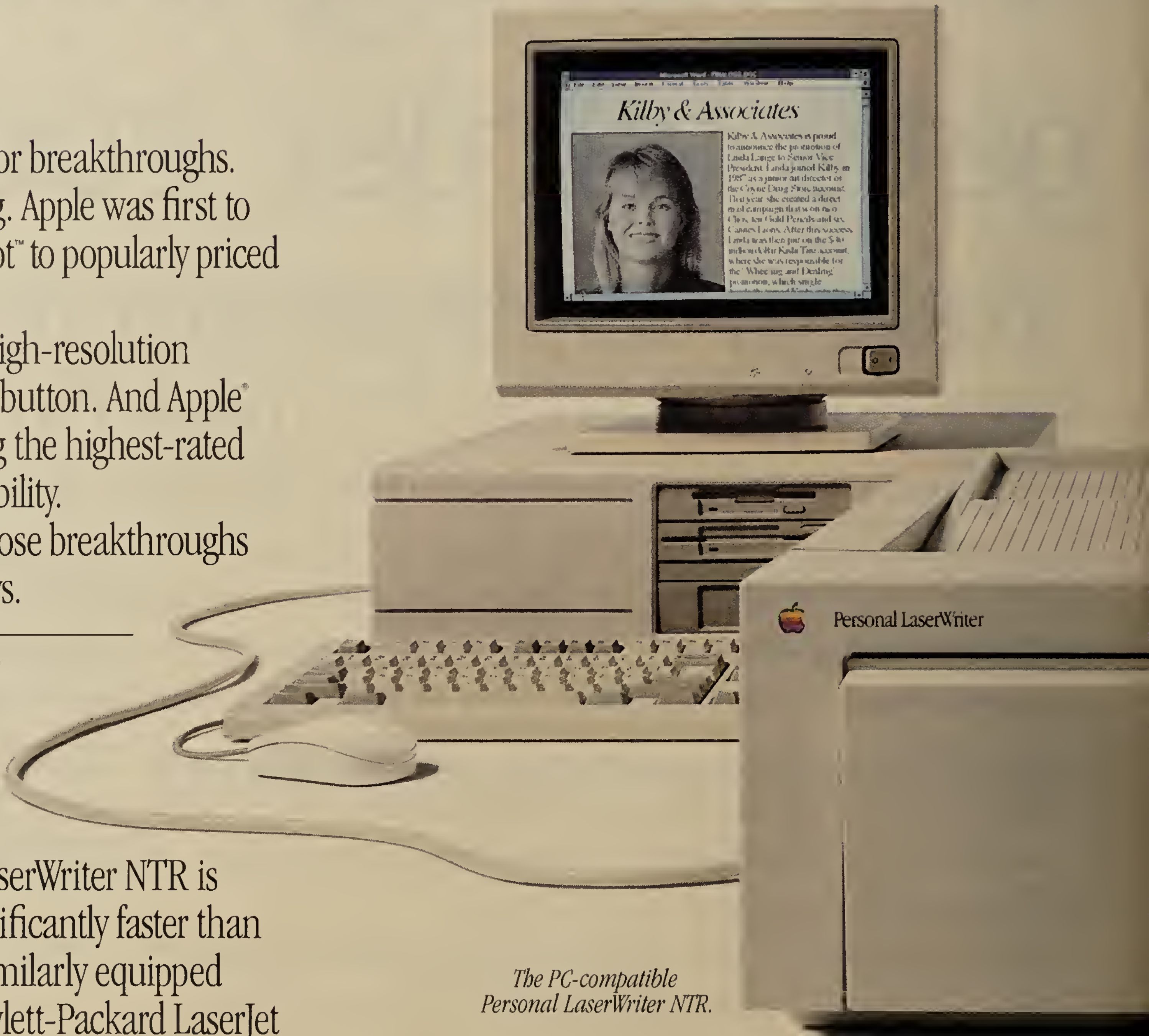

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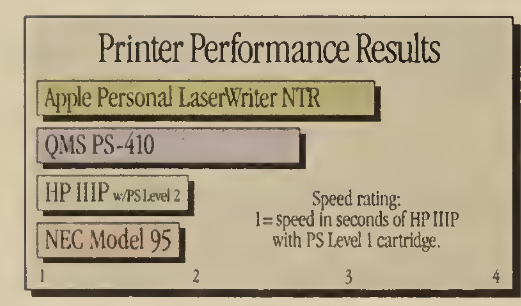

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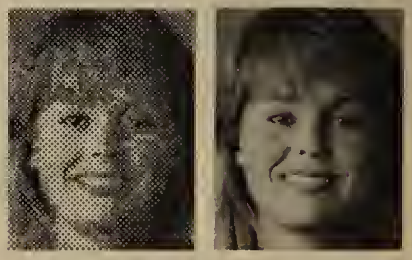

*On the left, conventional laser printing. On the right, Apple PhotoGrade printing. Which will do more for your image?*

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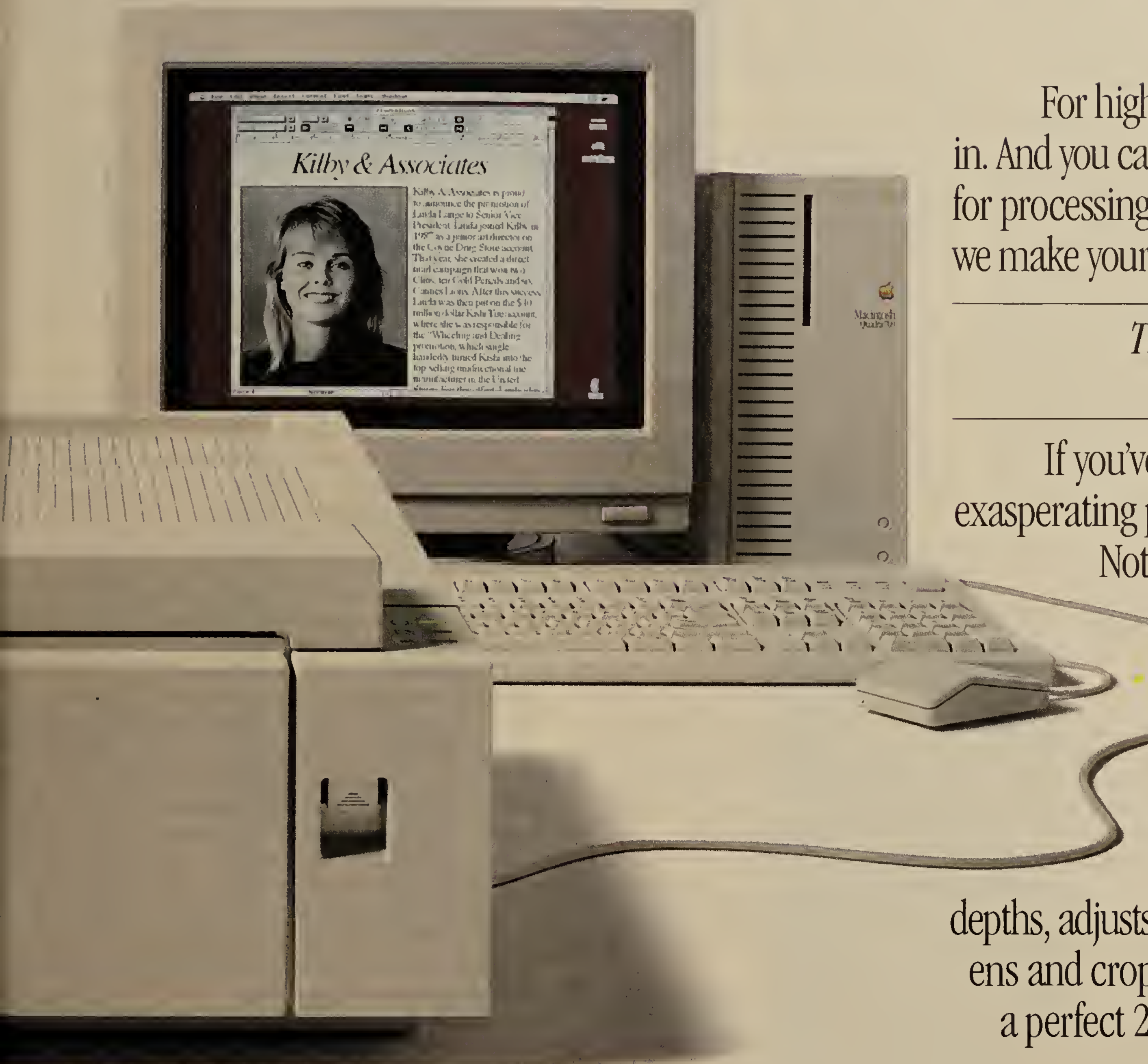

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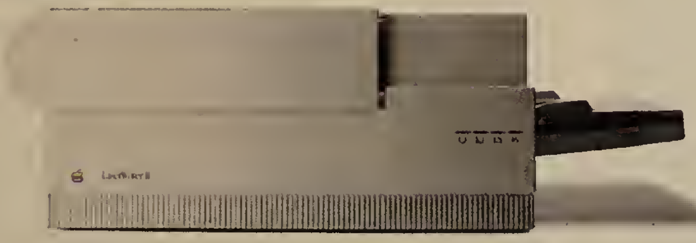

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# ADVANCED TECHNOLOGY

## TECH TALK

### End of school?

■ The current school year will go ahead as usual. But many scientists, educators and science fiction writers think the classroom of the future will be inside computer networks. About 100 scientists and writers made their best-guess predictions on the future of the classroom as part of the eighth annual L. Ron Hubbard Awards for winners of the 1991 International Writers and Illustrators of the Future Contest. Among the predictions were the following: Students in the future will experience subjects as part of "virtual reality" field trips to such places as Ancient Greece and World War II-era Europe. The forecasts were sealed in a time capsule and will be opened on Aug. 24, 2042.

### Thinking vectors

■ Thinking Machines Corp. in Cambridge, Mass., has begun receiving vector chips from Texas Instruments, Inc. for its CM-5 massively parallel supercomputer. Thinking Machines said the vector chips increase performance in the 1,024-node Connection Machine CM-5 seven times over its predecessor, the CM-2.

### Going for a test spin

■ Ncube Corp. in Foster City, Calif., has sold its massively parallel computing platform, the Ncube 2, to Michelin America's Research and Development Corp. The company's Greenville, S.C., unit will use the 64-processor system on computational fluid dynamics and other complex calculations related to the mechanics of a spinning car tire.

### Cray lands at Ames

■ NASA tapped Cray Research, Inc. to provide a Y-MP C-90 supercomputer for the Ames Research Center in Mountain View, Calif. Cray bested NEC Corp. in Japan, which had hoped to establish a toehold in the federal government. The deal has been watched as both the U.S. and Japan charge that their supercomputers are barred in the others' government markets.

## The whole world in your pocket

*Low-orbit satellites could allow you to make moble calls from anywhere to anywhere*

BY ELLIS BOOKER
CW STAFF

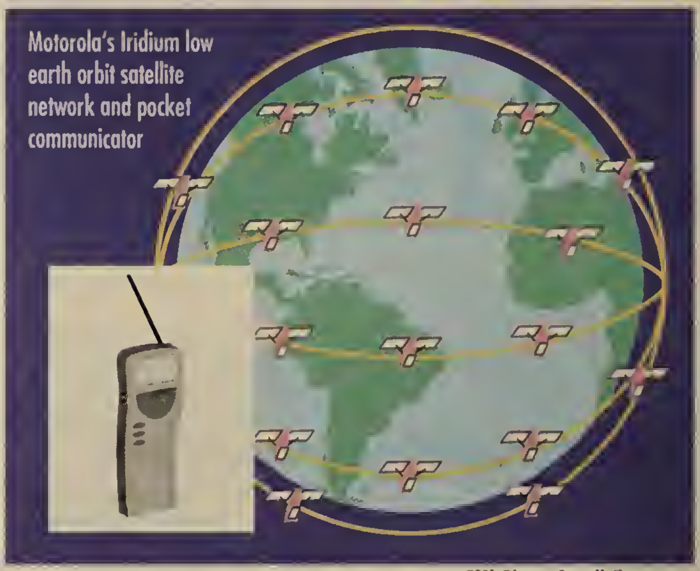
It is safari season and you find yourself deep inside the Serengeti, 650 miles from the nearest pay phone, and you need to touch base with the home office.

Fortunately, in the pocket of your khakis you have a device about the size and weight of a portable cellular phone from which you can place or receive a call to any other spot on the planet.

Still a few years off, this is one scenario for Iridium, Inc., which plans a network of dozens of low-earth orbit (LEO) satellites that will finally provide a seamless, global communications network for mobile subscribers.

A wholly owned subsidiary of Motorola, Inc., Washington, D.C.-based Iridium's global satellite network will become a reality in early 1998, when all 66 of its LEO satellites are deployed. Iridium recently revised its original plan, which had called for a constellation of 77 satellites. That earlier number gave Iridium its name: 77 electrons fly around the nucleus of an iridium atom.

While safari hunters in out-of-the-way places may use Iridium, the network will have its greatest impact on business customers who could use the satellite network to bypass the difficulties of dealing with communication infrastructures of developing nations.


Motorola's Iridium low earth orbit satellite network and pocket communicator

CW Chart: Janell Genovese

Along with voice services, Iridium will be able to carry low-speed (2.4K bit/sec.) data transmissions. In addition, one inherent aspect of the Iridium scheme is radio determination, a means of locating the position of the mobile subscriber on the map.

While Iridium will start with global voice services, it might develop applications for the global positioning feature at a later date, company spokesman John M. Windolph said.

Windolph estimated the cost for an Iridium call will be in the neighborhood of $3 per minute; the dual-mode Iridium handset — the phone will be able to use the satellite network as well as the local terrestrial cellular system — will cost approximately $3,000.

Satellites for communications are nothing new, of course. Even today, provided with the right hardware — a luggable transmitter/receiver and a parabolic dish — a hunter might set up a phone call from the safari trail.

But because Motorola and Iridium envision a far smaller, more portable phone — something about the size of today's 4 to 5 ounce cellular phone — that can communicate directly with the satellite, this means lower-orbit satellites that require substantially less powerful portable units on the ground.

Conventional communications satellites fly at 23,300 nautical miles above the earth. Iridium's "birds" will fly at an altitude of just 420 nautical miles.

Last month, Iridium moved a step closer to having the Federal Communications Commission grant it an experimental license to launch and test five satellites in polar orbits.

Iridium anticipates the contract for the total system, including the satellite constellation and assorted control facilities, will be about $3.37 billion.

To raise the capital for the project, Motorola plans to divest all but 15% of its interest in Iridium. It plans to sell the remaining shares to a consortium of domestic and international carriers.

## Big LEO, little LEO

Data services via satellite systems will grow in the coming years, predicted Insight Research Corp. in Livingston, N.J. Revenue from global data network services on satellites will shoot up 67%, while revenue from voice services on satellites will actually decline about 4% between 1990 and 1996. Data services on satellites will grow from $1.33 billion today to $8.4 billion in 1996, Insight said.

Insight President Robert Rosenberg explained the two classes of LEO satellites now in development: those like Iridium that transmit and receive at frequencies above 1 GHz (big LEO) and handle voice, text and data; and those that transmit and receive at frequencies below 1 GHz (little LEO), which are suitable for text and data messaging only.

"There are a host of companies that have staked out positions in both LEOs, and there's a race on now to design and deploy them," Rosenberg said. Both types of LEOs got an important boost earlier this year at the World Administrative Radio Conference-92 meeting in Malaga, Spain.

ELLIS BOOKER

## Looking for power in the sky

BY ELLIS BOOKER
CW STAFF

Say what you will about the telephones of yesteryear. They had one distinct advantage over newfangled handsets: They did not require AC or battery power.

Even powering terminals (for example, phones and other electronic systems) in optical-fiber networks is troublesome. That is because optical fiber, unlike copper cable, cannot carry electrical energy to devices in the field.

But researchers at Bellcore in Chester, N.J., have begun looking skyward for an answer. Bellcore scientists are exploring the use of solar power for optical components in the field, with an eye toward putting the solar collectors as close to the customer as possible.

Bellcore found it could use a solar power system — composed of two side-by-side photovoltaic solar panels mounted on a 14-foot poll — to collect enough energy to satisfy the telephone needs of four average U.S. households.

Solar energy is converted to low-voltage DC and transferred over a cable to commercial lead acid batteries. Batteries are attached to conventional electronics for use on cloudy days.

Along with obvious environmental benefits, Bellcore researchers said, their system could provide areas with abundant sunlight, such as the South and the Southwest, pollution-free power at costs comparable with other methods for powering optical electronics.

Bellcore said its prototype will be tested as part of a "fiber-in-the-loop" study later this year with US West.

Meanwhile, other telecommunications engineers are preparing for the day when optical lines extend to subscribers' homes and business. Power solutions being discussed include sending high-energy light pulses to photoelectric cells inside the optical subscriber's site.

# The Life of Brian

**"WE'RE SO CONFIDENT IN OUR NETWORK STORAGE TECHNOLOGY, THAT IF YOU'LL SEND US YOUR NETWORK SYSTEMS ADMINISTRATOR FOR 4 HOURS, WE'LL PAY THAT PERSON'S SALARY FOR A FULL DAY," INVITES BRIAN SWAFFORD, FOUNDER AND PRESIDENT OF QSTAR TECHNOLOGIES, INC.**

### I WAS JUST A KID.

Even when I was young, I wanted to do world-changing kinds of things. I remember wanting to build the ultimate library, where anyone could access every book ever written at the touch of a button. My library would reside on a giant space station.

### SO I MAJORED IN MATH, AND JOINED NASA.

Actually it was a double major: math and physics. Math for the massively complex file management algorithms, and physics because ... well, getting that much stuff into orbit seemed like a non-trivial physics problem. Is it any wonder I found myself at NASA's National Space Science Data Center heading up Networking and Mass Storage R&D?

### I GOT TO BUILD THE NEATEST OPTICAL DISK NETWORKS THIS PLANET HAS EVER SEEN.

If you've heard of the Space Physics Analysis Network — or SPAN — I worked on it. And on many massive optical storage systems as well. I never did get to build my space station library of every book ever written, but it's amazing just how much information I got into orbit on revolving optical disks.

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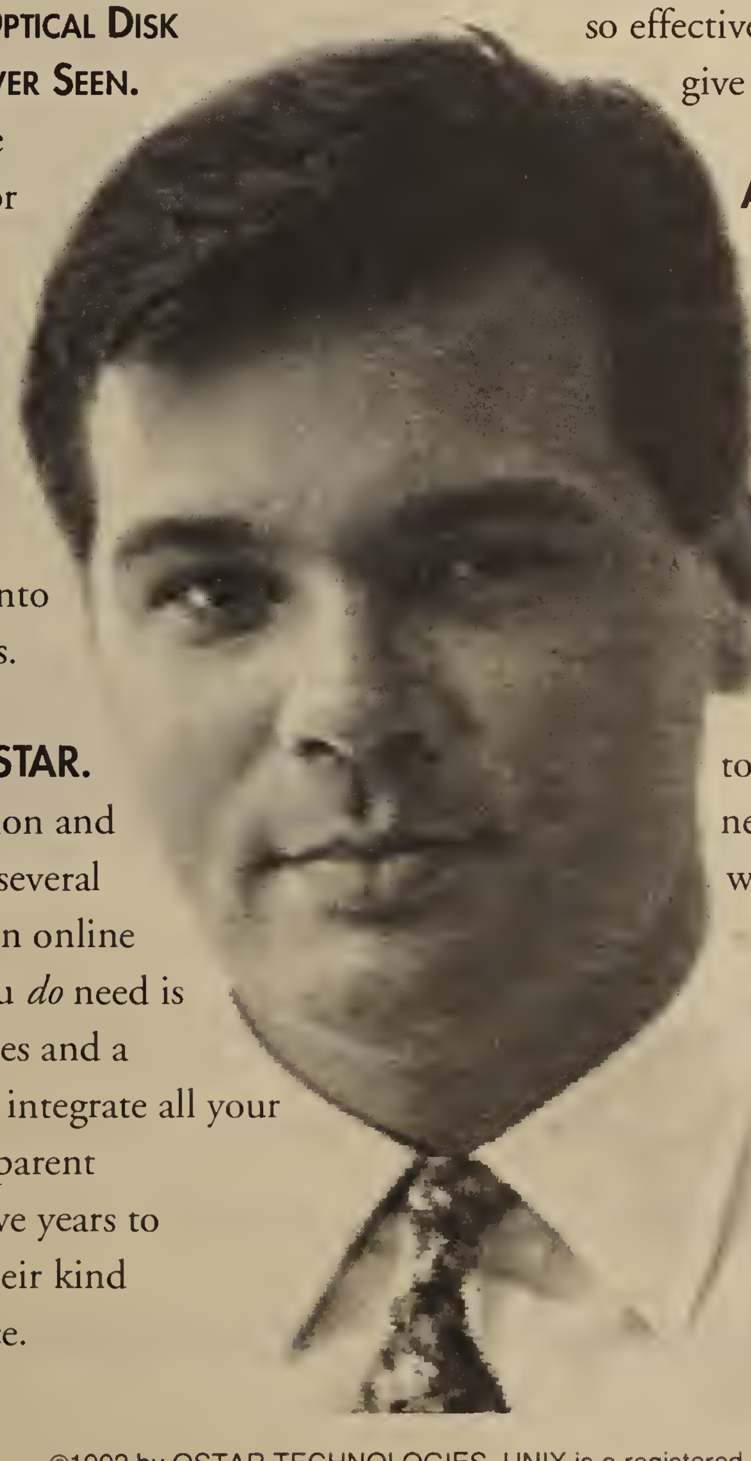

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EDITORIAL

# It ain't over yet

"Dewey defeats Truman."

I sometimes think of that 1948 headline from the *Chicago Daily Tribune* whenever I read about another columnist or stock-picker who's decided to declare Microsoft the winner in the desktop operating system derby. Is it really possible for a race to be over before it even starts?

Not by a long shot. There won't be a hands-down winner in this marathon, and it's sad to see corporate IS under pressure to choose sides when there are so many miles left to go.

I'll give you the view from my own desktop. As a closet techie, I had Windows installed on my 386/33 clone about two weeks after 3.0 came out. I upgraded to 3.1 two months ago. Great product. Fast, colorful and (finally) reasonably bulletproof.

Then I installed IBM's OS/2. And lately I've been zipping around the desktop, popping up windows, multitasking and mixing character and graphics applications as if they were meant for each other. Great product.

The problem is, neither environment does exactly what I want it to. Windows has wide third-party support, a more intuitive look and feel, a slick installation and excellent overall performance.

OS/2 is comparatively clunky, and I had to ask my IS department to install it. But it has one big thing Windows doesn't: real-live multitasking. For a 10-year MS-DOS user like myself, the idea of working on a document while simultaneously formatting a disk and dialing up MCI Mail is enough to make you salivate.

Why make a choice? Pick what's best for your needs right now, and put the squeeze on your vendor to fill in the gaps. Windows and OS/2 do have something in common: They're a darned sight better than what we had before, and they both have the support of powerful vendors that are committed to fighting this one out.

Remember how long it's taken to get here. Windows was announced in 1983; the first really usable product shipped in 1990. OS/2 was announced in 1987 and hit its stride about six months ago. So by my watch, OS/2 isn't too far off schedule.

Both companies acknowledge the shortcomings of their current products and say they'll fix them. We'll see. I hope someday we'll have a product that combines the youthful energy of Windows with the maturity and wisdom of OS/2. Maybe we'll have two products that do that.

So why make a choice? The operating system battle is being stirred up by marketing departments that have everything in the world to gain by making this an either/or decision. But for corporate users, the view is pretty good from up on the fence.

You might wonder what is running on my desktop right now. It's OS/2. But tomorrow is another day.

Paul Gillin

Paul Gillin, *Executive editor*

LETTERS TO THE EDITOR

## One CA product is lauded, another is not

I was disappointed in the Buyers' Scorecard that reviewed mainframe relational database management systems [CW, Aug. 17]. Computer Associates' CA-IDMS 12.0 was omitted from your product list.

While CA-IDMS is most often associated with its traditional Conference of Data Systems Languages (navigational) heritage, the newest release has an architecture that provides other navigational and relational technologies in a single DBMS engine.

This new engine provides the ability to access navigational data with SQL, as well as provide access to newly defined SQL tables.

Application code can also access navigational and relational data at the same time. In this respect, the CA-IDMS 12.0 engine is somewhat analogous to that of CA-Datacom 8.0.

As an early participant in CA-IDMS 12.0's beta-test cycle, my site has had the opportunity to exercise the new DBMS engine. CA has delivered on its promise of relational technology in an evolutionary rather than revolutionary manner.

Our investment in IDMS application software has been protected, but most importantly, our investment has been significantly enhanced.

*James F. Bradshaw*
*Clemson University*
*Clemson, S.C.*

If Computer Associates hopes to "break its mainframe shackles" [CW, Aug. 17], it is going to have to do more than change public perceptions of its role in the PC software market. It will have to ship decent products as well.

CA-dBFast is the buggiest piece of PC software I have come across in more than a decade of consulting.

The software hangs the machine in countless ways, sending the mouse cursor into blinking/beeping fits. And the program won't even read a large (but simple) database file that ran fine on Foxbase.

My calls to CA's technical support line were equally maddening. I spoke to a tech support rep who sounded more like a fast-talking salesman and gave me workarounds (such as using keyboard commands instead of the mouse — how's that for a Windows product?) without even acknowledging the program's many inexcusable defects.

*Steven Salemi*
*SouthWest Systems, Inc.*
*Santa Fe, N.M.*

## Enticements

Assuming that the "Downsizing enticements" you cite are correct [CW, Aug. 24], you have either discovered why Digital Equipment Corp. lost more than $1 billion last year or why insurance costs have gone through the ceiling. To wit:

- A DEC RA91 disk drive is 1.2G bytes and can be obtained at this time for less than $7,000.
- Swapping motherboards should be the least of concerns for a corporate systems manager.
- A company that has programmers activating batch jobs from home must have some truly interesting job descriptions for its IS staff.

*Ray Davis*
*Sheffield Steel Corp.*
*Sand Springs, Okla.*

## With IBM shift, what about VM?

Regarding "IBM repository shift suits users, for now" [CW, July 27], announcements concerning IBM's change in plans for Repository Manager have been met with approval but some concern.

Large corporations have a big investment in mainframe technology used to support applications that may not be easily moved to a LAN-only environment. Since IBM is reconsidering its position on the placement of Repository Manager, has anyone at the company considered VM?

VM has been the stepchild of IBM's offerings. While it appears to be fully blessed with its own ESA release, many feel IBM could do more to promote this platform.

VM is one of the most heavily used office automation platforms. Many companies rely on it to serve large numbers of users in an efficient and relatively friendly manner.

VM is a natural file server — the ultimate LAN platform. Can IBM afford to overlook VM's potential as a repository manager and not help large companies leverage their mainframes for all they're worth?

*Stephen O'Malley*
*Nynex Corp.*
*White Plains, N.Y.*

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor in Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*

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# Sabotage of the airline systems

MAX HOPPER

While many inefficient U.S. enterprises have fallen prey to aggressive global competition, the U.S.' world-class companies may have only Congress to fear.

The House of Representatives has passed a bill that, if approved by the Senate, would severely cripple airline computerized reservation systems (CRS), one of our country's most advanced and efficient electronic distribution networks.

Over time, these systems have created a perfect marketplace within the airline industry, enhancing competition worldwide. The day a new airline begins flying it can display its fare and schedules on the industry "shelf" and compete head to head with even the largest airlines, without paying a dime to the CRS unless its products are sold.

For years, some less successful airlines and CRS vendors have broadcast false claims of monopolies, architectural system bias and anticompetitiveness. These myths persist, despite years of court actions ruling the claims invalid. Having failed to sway the courts and to compete successfully in a deregulated airline market, the critics of prosperous CRSs now seek the antithesis of competition and the last refuge of inefficient producers — regulation.

This CRS legislation, grossly mislabeled the "Airline Competition Enhancement Act," is nothing more than special-interest legislation. It proposes to "enhance" competition by restricting contractual rights between CRS vendors and their travel agency customers. It would impose strict technical standards on systems operations, and it would restrict the CRS industry's freedom to set its own prices.

Such a convoluted "cure" could be endorsed only by those same keen strategists who attempt to spend their way out of debt by taxing us into prosperity.

In how many industries are contract lengths between two business parties limited by legislation? Should legislation void a five-year contract that a company fairly awards to a CRS vendor in order to give a competing vendor who lost the contract (and promoted the legislation) a second chance at the business?

Does Congress really have the credentials to decide how major systems should be technologically developed? Does it have the wisdom or moral authority to dictate the price businesses should charge for their products? Should a company that invested in the development of proprietary technology be compelled by the U.S. government to turn it over, free of charge, for use by a competitor?

Michael Siggins

## Already neutral

Clearly these proposals are absurd. Even the portion of the bill that calls for system neutrality is unnecessary. All four U.S. CRSs sell flights for all participating U.S. airlines and many international carriers. It only makes sense that all CRS-owning airlines would demand nonbiased systems of each other.

The proposed regulations are the worst form of meddling in a free marketplace. They are promoted under the lofty-sounding premise of a "level playing field." But the political process of leveling the playing field in the name of equality can only tilt the top end down and standardize the market alternatives at the lowest common denominator.

Deliberately damaging CSRs Sabre and Apollo will do nothing to help consumers, travel agents or the airline industry. It will, however, lower the quality of information available to airline customers, discourage development of CRS technology and demonstrate to businesses of every stripe that the U.S. Congress is willing to punish our economy's winners.

---

Hopper is senior vice president of information systems at AMR Corp.

# Learn the lingo and become an 'insider'

MICHAEL COHN

Buzzwords are the key to professional success. Lawyers use them to keep one step ahead of clients. Doctors use them to keep one step ahead of lawyers. And we computer folks use them to confuse management, confound users, dazzle the opposite sex at parties and recognize our real peers.

In addition to the buzzwords that we use in public — the ones that the media and users are always trying to co-opt — there are some real insider terms that function a little like a secret handshake.

These are the words used by a handful of old timers — the folks who have been around the block a few times, read dumps in their sleep and have calculators that are more expensive than their cars. If you want to mix with this fraternity, pay attention and I'll clue you in to a few of their favorites.

**Doubtsourcing:** High-tech insiders use this term when they don't trust the company that runs their systems off-site. You'll occasionally hear about doubtsourcing, unless the relationship has gotten so bad that it's turned into "shoutsourcing."

**Downsqueezing:** Trying to get a 7 ft 3 in. mainframe out through a 7 ft computer room door.

**Printegration:** Occasionally, users buy lots of different types of systems and then want IS to do something about it. When the manuals say the systems are all supposed to work together but no one has a clue as to what's going on, that's printegration.

Printegration eventually deteriorates into local-area networks, where nothing can talk to anything and eventually IS managers just give up and adopt a standard of "open anarchitecture."

**Praysed floor:** This is where companies keep the million-dollar mainframe that everyone prays will stay up until month's end.

Then again, some shops trash the mainframe and get smaller distributed systems. These usually work for about six minutes, until the network crashes and communications get cut. These are called the "client severs."

And some shops go in the other direction and buy large mega-expensive systems that are guaranteed never to go down. So when they do, people really lose their tempers. That's why these are called "fault hollerant."

**DUSD:** Dud DASD. Of course, not all DASD is DUSD. But if you want density and high tech, move up to leading-edge, image-oriented storage systems: "obstacle disk."

**Yousability:** If users would let us handle their software, the world would be a better place. But instead they sneak off and buy all kinds of disparate applications, most of which are "IBM-combatible."

That's when IS has to put its foot down. That's when you tell your users, "From now on, all software will be 'yousable.' . . . You figure out the stuff and leave us alone."

If end users followed standards, none of this would happen. But they don't, and they always wind up with software that is "user-fiendly."

**Delational waitabase:** Most IS managers put off implementing 4GLs and centralized data. The folks who don't have the time and decide to wait will eventually build a "repausitory." But the folks who don't have the skill or knowledge will eventually build an "Information Wherehows" . . . either that, or a resume.

**Discover resistory**: That's what the chief information officer finds when he looks for a volunteer to write the IS contingency plan.

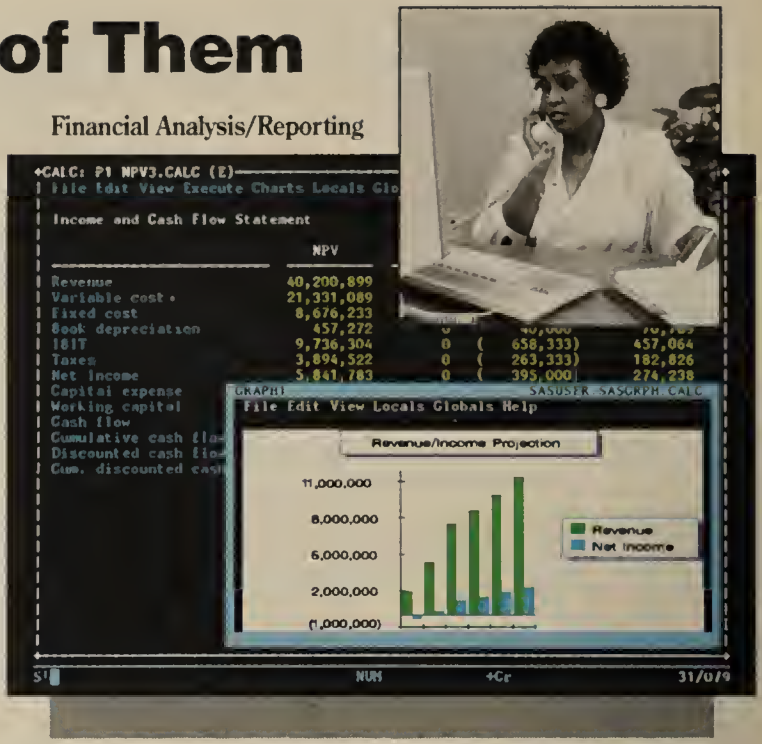
---

Cohn works for a very large computer company in Atlanta.

# Because There Are More of Them Than There Are of You...

Business Planning

Financial Analysis/Reporting



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 Income and Cash Flow Statement

                                   NPV
 Revenue                      40,200,899
 Variable cost •              21,331,089
 Fixed cost                    8,676,233
 Book depreciation               457,272
 EBIT                          9,736,304      0   (   658,333)    457,064
 Taxes                         3,894,522      0   (   263,333)    182,826
 Net income                    5,841,783      0   (   395,000)    274,238
 Capital expense
 Working capital
 Cash flow
 Cumulative cash flo
 Discounted cash flo
 Cum. discounted cash
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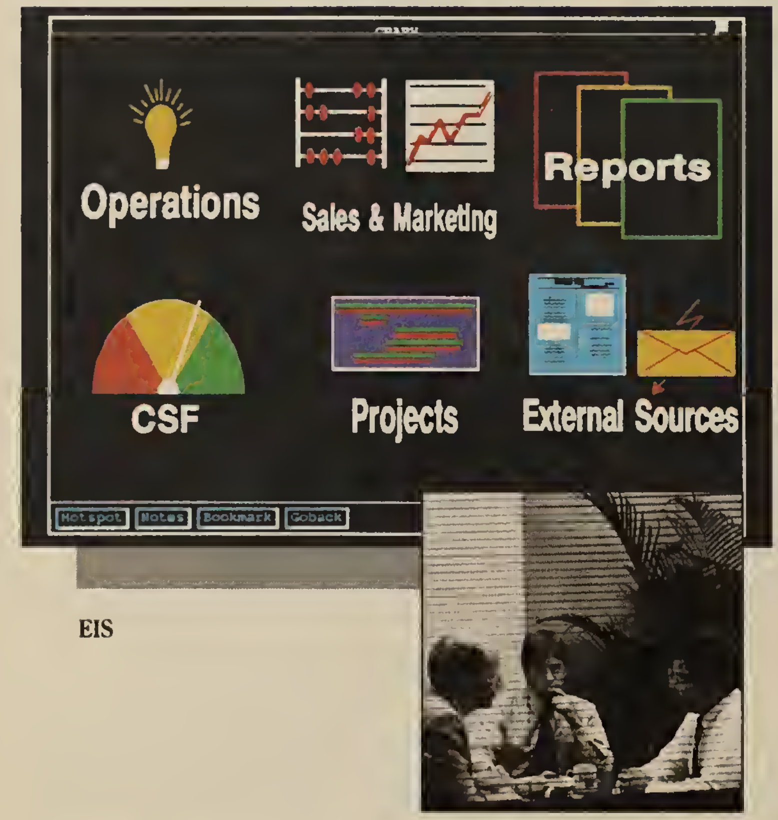
# The SAS® System for Information Delivery



EIS

The CEO needs visual checks on all the factors critical to the success of the business. The CFO wants a "small" change in the financial reports. The marketing VP is anxiously awaiting pricing models. And they're *still* waiting for inventory and quality monitoring systems out on the factory floor. How can one IS manager—with so little time, so few resources, and so many budget constraints—meet the diverse needs of so many clients? The answer is the SAS System for Information Delivery.

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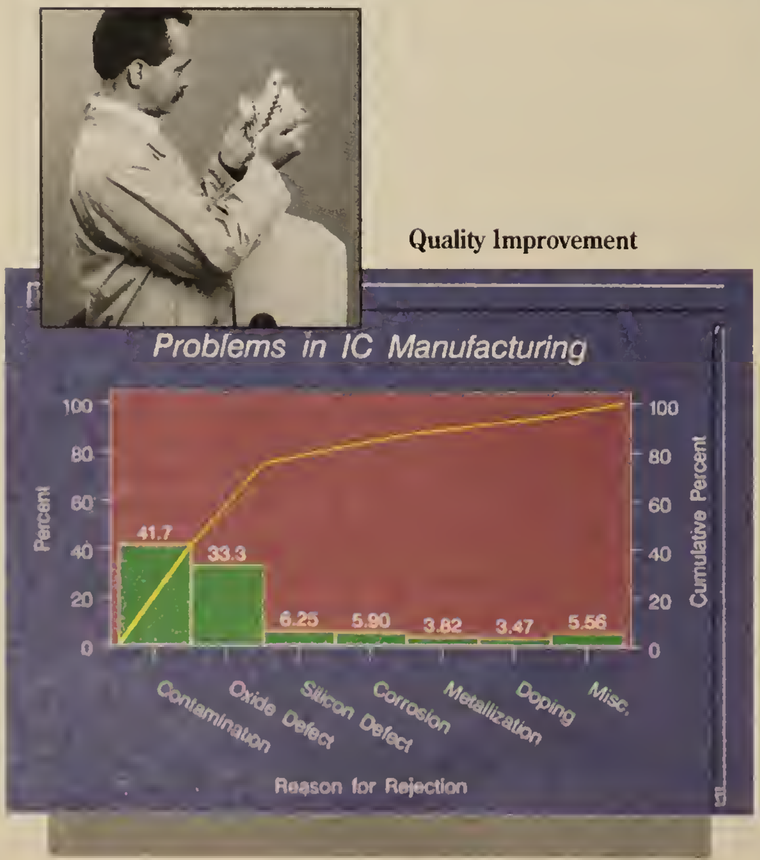

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Data Visualization

# Flow, quality tracker is repackaged

BY MICHELE DOSTERT
CW STAFF

Recently repackaged personal computer software promises to help information systems groups track the flow and quality of their projects by analyzing progress on key function points.

Applied Business Technology Corp. (ABT) introduced a quality measurement package, called Metrics Manager, to help IS groups measure, track and improve their quality, productivity and customer satisfaction.

According to Danek Bienkowski, executive vice president and co-founder of New York-based ABT, the product lets managers establish a baseline for their current quality and productivity, identify variables that affect these areas and more accurately forecast the requirements of future projects.

At a price of $14,950 for the basic package and one year of support, plus optional industry-example databases and training, Metrics Manager is not inexpensive. However, one software quality measurement expert said she thinks users will save far more than they spend on the product. Nancy Spencer, a Downers Grove, Ill.-based consultant at Framingham, Mass.-based venture-capital firm NorthPoint Software, is the author of a report on metrics and measurement in software development who consult-

*Continued on page 32*

# New generation of portables challenges IS

BY JAMES DALY
CW STAFF

Rocked by cutthroat pricing battles and shrinking margins, many captains of the personal computer industry — including Apple Computer, Inc. and IBM — are hoping to revitalize the sluggish desktop market early next year with the introduction of lightweight, task-specific, pocket-size systems.

As these machines ferret their way into every conceivable market — and many analysts are betting they will — they could present a bold new challenge to the efforts of information systems to effectively manage distributed technology.

"In two or three years, the rules regarding how we handle information on the desktop might be entirely different than they are today," said Jeffrey Henning, a senior analyst at BIS Strategic Decisions, a research firm in Norwell, Mass.

The impetus for this shift will be a device that today goes by several monikers: personal digital assistants (PDAs, which is the name we'll use here), personal communicators, information appliances — even picocomputers, or personal intelligent communicator.

These highly intelligent devices promise to ultimately weigh 1 pound or less; offer crisp readable displays, handwriting and voice recognition, wireless fax and modem communications and a pager; cost about $500; and offer software so intuitive that only seconds after you scribble "lunch with Pam" on its screen, Pam will have received a query fax, and the appointment will be entered in your appointment book.

These machines are not souped-up calculators or personal computers on a diet. "These machines are more than just small computers. They'll be consumer products and communications devices as well," said Richard Shaffer, publisher of the "ComputerLetter" newsletter in New York. "In fact, they could fundamentally change the way we do computing."

And that is why analysts are saying it is not too early to start drawing up a blueprint for integrating PDAs within your organization. William Bluestein, a senior analyst at Forrester Research, Inc. in Cambridge, Mass., said the little machines will have a big impact on IS.

"A new class of IS is needed," he said — one whose expertise will focus on the new hardware, software and applications development process required for the new designs' software development. Bluestein called this specialization "field MIS."

Unlike general-purpose notepad pen systems such as NCR Corp.'s 3125, PDAs will be special-purpose devices. For example, a tablet-size PDA for sales personnel will feature product information and contracts; another for dock workers will be outfitted with data collection accessories such as bar code readers and scanners.

That's an exciting prospect for users. Richard Lester, vice president of information services at Associated Grocers, Inc. in Seattle, said he would like to outfit grocery clerks with PDAs in order to stay current on the tens of thousands of items typically for sale at an average supermarket. "We're not necessarily talking

*Continued on page 32*

## Who's involved?

If all highfalutin PDA claims sound like something out of an old Dick Tracy comic strip, "ComputerLetter" publisher Richard Shaffer noted, this type of machine could be cobbled together today with existing technology. The first models, however, will not be available until early next year when Apple releases Newton.

IBM is another firm eyeballing the market, and it plans to make a splash in November at Comdex/Fall '92 when it demonstrates its first prototype PDA — a handheld device with 1.8-in. drives that can accommodate up to 40M bytes of flash memory and weighs about 2 pounds.

In addition, a Mountain View, Calif.-based start-up called Eo, Inc. is working on a handheld device that uses a pen to organize and manipulate data and has built-in wireless communications capabilities. Other vendors planning PDAs include Sharp Corp., Tandy Corp., Toshiba America Information Systems, Inc. and Casio Computer Co.

Although product plans are just emerging, the U.S. market for PDAs will likely top $500 million by the end of the 1990s, according to researchers at BIS Strategic Decisions.

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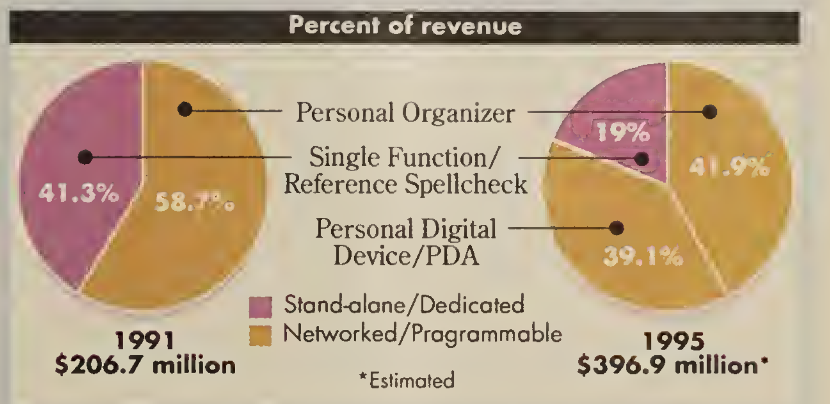

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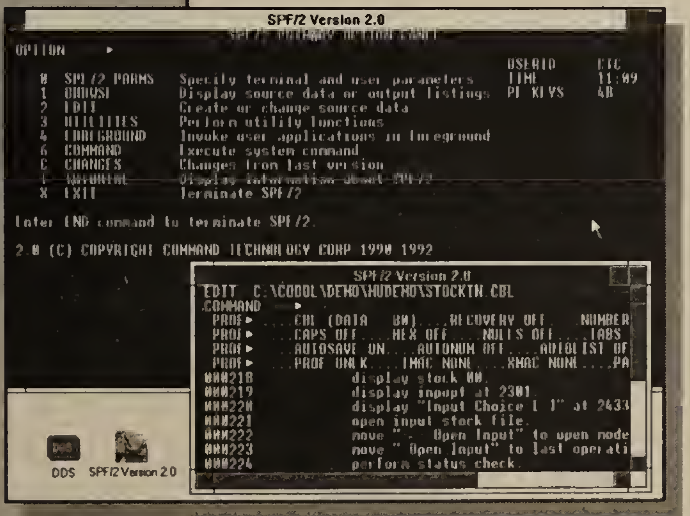

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# Updated package ups WordPerfect profile

BY CAROL J. HILDEBRAND
CW STAFF

WordPerfect Corp. is beefing up its graphics offering — and giving it a name change in the bargain.

The product, formerly known as DrawPerfect, will now be known as WordPerfect Presentations to better reflect its positioning as a presentation graphics package, said Todd Titensor, director of product marketing at the company.

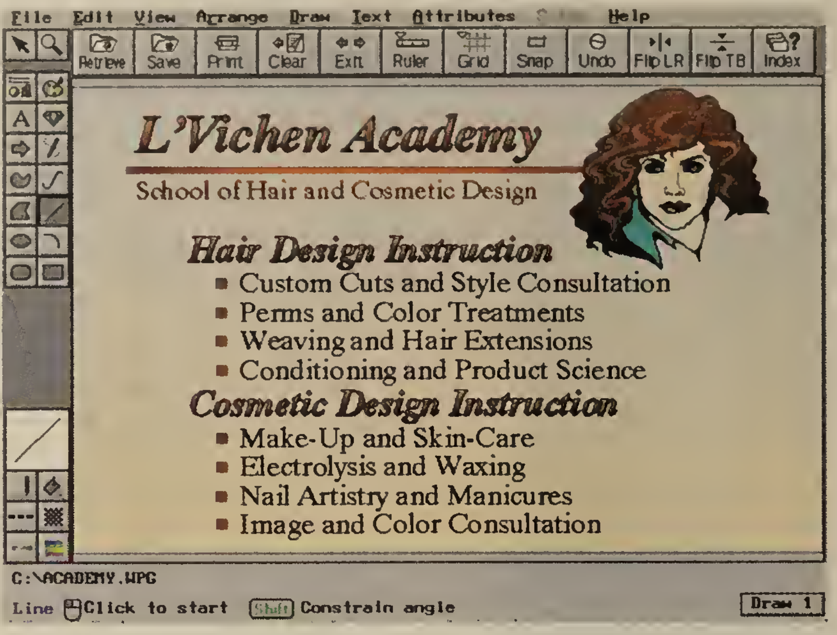
Version 2.0 for DOS, currently in beta testing, is due out this month, while the Microsoft Corp. Windows version is expected in December, Titensor said.

The version features a vastly different user interface that is a hybrid DOS/Windows interface, with button bars, mouse support and drawing tools represented by icons. The drawing and charting capabilities have also been greatly enhanced, with users allowed to create slides in the outline format through templates and move them around using a slide sorter. Clip art has been extended to 1,000 images, and audio clips are also being included.

Read Gilgen, director of learning support services at the University of Wisconsin in Madison, found that the improvements, such as the addition of bezier curves in the drawing tools and enhanced charting options, cut down on the time it takes to create a show. "It took me about an hour to do eight or nine different charts," he said. Gilgen also liked the new interface, saying that "it's about as 'Windowsy' as you can get without being Windows."

Analysts said that a higher profile from WordPerfect in this market is a plus, as the field has opened up somewhat. With Aldus Corp. in financial straits, Micrografx, Inc.'s Charisma needing an upgrade and Hollywood lost in the Claris Corp. shuffle, "the race seems to be Powerpoint, Freelance and Harvard," said Bill Coggshall, president of New Media Research, Inc. in Los Altos, Calif. "That's not trivial competition, but frankly, it makes good sense to have a product in this category and push it heavily."

However, WordPerfect is a little late to the Windows party. Software Publishing Corp. in Santa Clara, Calif., shipped market leader Harvard Graphics for Windows about eight months ago.



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C:\ACADEMY.WPG
Line Click to start Constrain angle

**The newly named** *WordPerfect Presentations has a hybrid DOS/Windows interface*

# New generation of portables challenges IS

CONTINUED FROM PAGE 31

about putting huge databases on them — just a category's worth of information, like how items are priced and where they are placed on the shelves," Lester said.

As PDAs grow in popularity, a dial-in help desk will be required for mobile users. Since both hardware and software will be highly task-specific, the help desk staff members will need broad-based application knowledge.

"Building the expertise for a broad-based help desk could be our toughest challenge," said George Tabback, director of corporate information systems at Ingersoll-Rand Co. in Woodcliff Lake, N.J.

### Changed focus

IS will also write fewer applications like payroll and accounting. More focus will be on order entry and on-line product information.

IS will also become an electronic publisher. With corporate electronic manuals, it will deliver catalogs, data and applications to workers in the field. This will require expertise in multimedia programming and compact disc/read-only memory technologies.

"There won't be the traditional porting of applications we see with new platforms," Henning said. "Instead, we'll see the creation of more applications driven by their connectivity abilities."

A typical application, he said, might be one that would allow a user whose travel plans have suddenly changed to wirelessly dial into a central server and call up maps, hotels or restaurant guides for the new destination.

While major obstacles still need to be cleared, users seem ready to take the leap.

"We're very excited about what PDAs offer," Lester said. "It will take some work to integrate them, but they could also have a very positive and stimulating effect on the organization."

## On the network side

PDA applications will put new pressure on network administrators, who will play a major role in their success. Excellent communications will be the key. Andrew Seybold editor of "The Outlook on Professional Computing," based in Brookdale, Calif., wrote in his newsletter, "without an umbilical cord of some kind, [Apple's] Newton is at best a much improved Sharp Wizard or Casio Boss."

Another key will be central host services for mobile computers. Companies will increasingly purchase wide-area services to support and connect the new machines, said William Bluestein, a senior analyst at Forrester Research. The role of the networking group will change from that of general contractor building the private network to that of manager of these purchased services. The growing use of wireless data transmission will also create new security concerns.

"Easy to use often means easy to lose, and an emphasis on wireless makes me very wary about confidentiality of data," said George Tabback, director of corporate information systems at Ingersoll-Rand. "Security is going to be absolutely critical."

A dial-in help desk will be required for mobile users. Since both hardware and software will be highly task-specific, the help desk staffers will need broad-based application knowledge.

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# Flow, quality tracker

CONTINUED FROM PAGE 31

ed on the development of Metrics Manager.

She noted: "A database project that is six months late because you didn't have the tools to accurately plan it is going to cost a lot more than $14,950. It could also cost you your job."

Metrics Manager is based on two fundamental IS management principles. First, the program uses "function points" to determine the size of a project.

Proponents claim that functionality is a more accurate measurement of scale than simply counting lines of code. Once a project has been measured in function points, measurements of variables can be added to the database.

### Development measures

Variables can include such things as time estimated, time to completion, programmer expertise, man-months needed, projected costs, actual costs, tools used, defects reported and customer satisfaction.

"You might, for example, discover that one type of application progressed at the rate of 13 function points per man-month, while another type can be developed at 20 function points per man-month," Bienkowski said.

"You could find out that a project that had 400 function points as designed grew to 750 function points during the review process. You could set a goal of fewer than X errors per X number of function points. You can analyze your system as a whole for reliability and functionality. The point is, it lets you measure and quantify your current quality and then plan how to improve it."

Metrics Manager was originally developed in 1990 by Computer Power Group, a New York-based consulting firm, and marketed as MARS, or Metric Analysis and Reporting System. Computer Power Group will continue to support the development of Metric Manager.

The program, which is shipping now, uses the Microsoft Corp. FoxPro database and runs on Intel Corp. 80386-based PCs. ABT added data import and export features for links with ABT's other project management products, Product Bridge for planning and estimating and Project Workbench for scheduling, tracking and reporting.

"I think there's a massive market for products like this in the long term," Spencer said.

"Just as auditors and financial people verify the financial health of your company, products of this type let systems people verify the performance of the systems arena in terms of productivity and quality," Spencer added.

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# Introduction

Electronic Data Interchange (EDI) is not just another IS tool, another step up the technology ladder. With its ability to expedite business transactions between trading partners, EDI can promote commerce at a time when the sluggish global economy is dragging commerce down. It is also a boon to companies operating within more vibrant economic conditions, as it allows them to compete even more effectively.

As a result of its unique user-driven nature, EDI has evolved in strict accordance with the needs of a variety of vertical industries, each of which has tailored its technology to meet proprietary needs. While this freedom is arguably the purest expression of technology put to productive use, it has also led to a melange of EDI "standards". Although efforts are in progress to unify users under one banner, a host of domestic and international obstacles — many not related to standards — must be overcome.

One of the most pressing and longest-running of those obstacles is the disparity of benefits EDI offers its varied constituents. In what has developed as a "haves" versus "have-nots" scenario, major retail and manufacturing companies that have implemented EDI are seen as forcing it on their suppliers, many of whom lack the resources to establish profitable EDI frameworks.

Although it is easy and appropriate to laud EDI for its potential as an economic catalyst, it does require attention on a technical level. Compared to other currently prominent technologies such as facsimile and imaging, EDI has a major advantage in that it is readily accessible for other applications.

As with other user-driven technologies such as personal computers, EDI has grown faster than IS' ability to obtain its full benefit. Now, IS is trying to provide broader and more integrated solutions that will allow users to get the most out of EDI while staying within the corporate IS structure.

Perhaps it is a good sign that so much attention is being paid to eliminating EDI's obstacles. That seems a sure indication that its ultimate success will be far-reaching.

*This White Paper was written independently of the Computerworld editorial department by Paul Zorfass and Caroline Michel of International Data Corp. Zorfass is a consultant director at IDC. Michel is a senior analyst in communications.*

*For more information on the White Paper Program, please call 508-879-0700.*

F

# ELECTRONIC DATA INTERCHANGE

EDI (Electronic Data Interchange) is as much an evolutionary catalyst for continuous business improvement as it is an IS technology. EDI is unique in that it combines critical elements of data processing, business processes and communications.

EDI is a worldwide phenomenon that provides the infrastructure necessary for mission-critical transactions. It is being aggressively implemented and backed by national governments in the U.S., Canada, Europe, Asia and the Pacific Rim (Asia/Pacific). EDI has the potential to spur economic development by facilitating commercial transactions.

EDI is defined as the computer-to-computer interchange of business transactions that conforms with specified standards over a communications network that includes at least two trading partners. These transactions include the interchange of common commercial information typically consisting of purchase orders, invoices, shipping notices and related acknowledgements. There are some special EDI characteristics that differentiate it from other processes and business solutions.

Most notably, EDI has been more user-driven than any other automated business solution. This has been advantageous for users because they have not been constrained by IS. They realize that characterizing EDI as a file transfer utility or as document-to-document interchange creates the wrong impression, one that does not portray the significant business benefits of EDI. Conversely, the user-driven nature of EDI has been disadvantageous to users because they lack the architectural and implementation coherence required by complex IS systems.

EDI growth has been bolstered by its appeal to some 30 vertical industry markets, each of which has become involved in specifying EDI standards for special interest organizations within that vertical industry. However, this vertical market appeal has undermined efforts to create a unified EDI standard. This situation has only recently been addressed by X12-Data Interchange Standards Association (X12/DISA). X12/DISA is the umbrella group for U.S. EDI standards, as chartered by the American National Standards Institute (ANSI).

The business and technology issues associated with EDI require special attention to project management, intra-enterprise cooperation and relationships between customers and suppliers. Companies that focus on these areas will realize competitive advantages.

The interchange of business information creates an extended enterprise environment. If the enterprise is viewed as a hub of activities, its trading partners can be viewed as spokes. Hubs represent the accumulation point for transactions from multiple trading partners. An example is a 350-store supermarket chain receiving direct store deliveries from its suppliers at all locations.

Typically, a larger spoke organization, such as a General Electric, RJR or Kodak, will be the hub for its own supplier network. Hubs have more specification power than spokes, which can lead to tension between the two trading partners.

## MARKET SIZE AND MEASURES

Although the EDI market is worldwide, it originated in the U.S. and continues to enjoy most of its popularity here. The EDI market is comprised of three components:

- EDI software
- Data transport/network services
- Professional services.

IDC estimates that the EDI revenues for these three components in the U.S., Europe and Asia/Pacific was $368 million in 1991. This figure is expected to reach $1.8 billion in 1996. This represents a compound annual growth rate of 37%. The projected growth by geographic trading area is 35% for the U.S., 36% for Europe and 48% for Asia/Pacific.

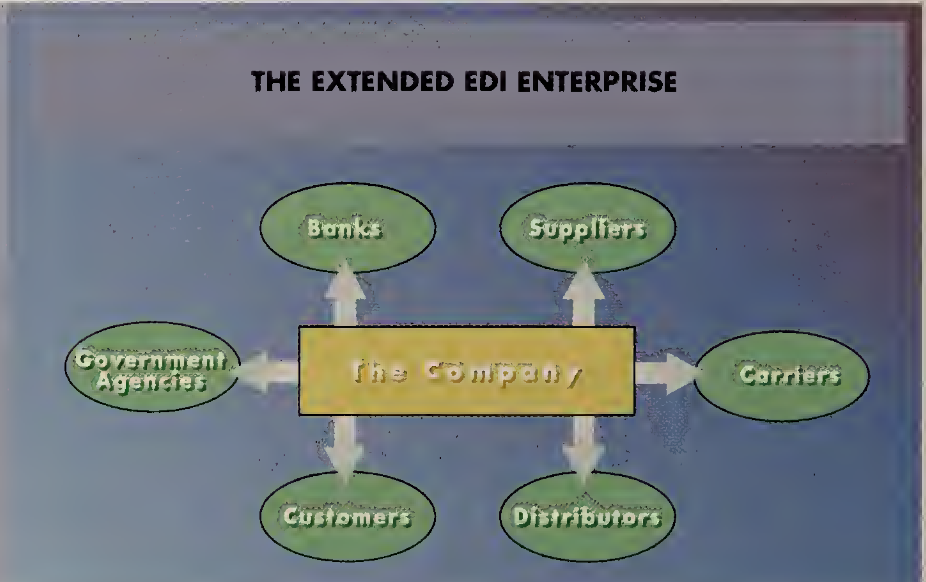
There are other parameters for measuring EDI's impact. For example, the banking community tracks the processing of EFT (Electronic Fund Transfers) transactions by the National Automated Clearing House. This is an excellent measure of how EDI is performing in the banking community. The best measure is the Corporate Trade Exchange (CTX) EFT transaction since it is compatible with the X12 ANSI EDI standard for remittance advice.

CTX transactions can automatically be processed from the automatic clearing house into a business's own EDI system. It is used for more than one invoice/payment. While the total number of transactions is modest, from the fourth quarter of 1990 to the fourth quarter of 1991, the number of CTX transactions processed went from 37,000 to 79,000, a growth of 114%.

The organization, "EDI, Spread the Word!", publishes the EDI Yellow Pages, listing EDI users. In July 1991, there were 21,000 registered users in this directory, and in July 1992, there were over 31,000.

The number of draft standards that X12/DISA has released for trial use over the last five years (excluding redundant transition standards) is steadily increasing. Maintenance activities continue at an active pace, showing interest and desire by users to make the standards more congruent with business practices.

**THE EXTENDED EDI ENTERPRISE**



Source: International Data Corp.

## EVOLVING BUSINESS AND IS PARTNERSHIPS IN THE '90s

Information technology trends such as downsizing and rightsizing are dynamics in the ever-changing relationship between IS and its business partners. As a result of such trends and economic imperatives, IS is being attached more securely to lines of business. Through all of these changes, IS must continue managing its high value-

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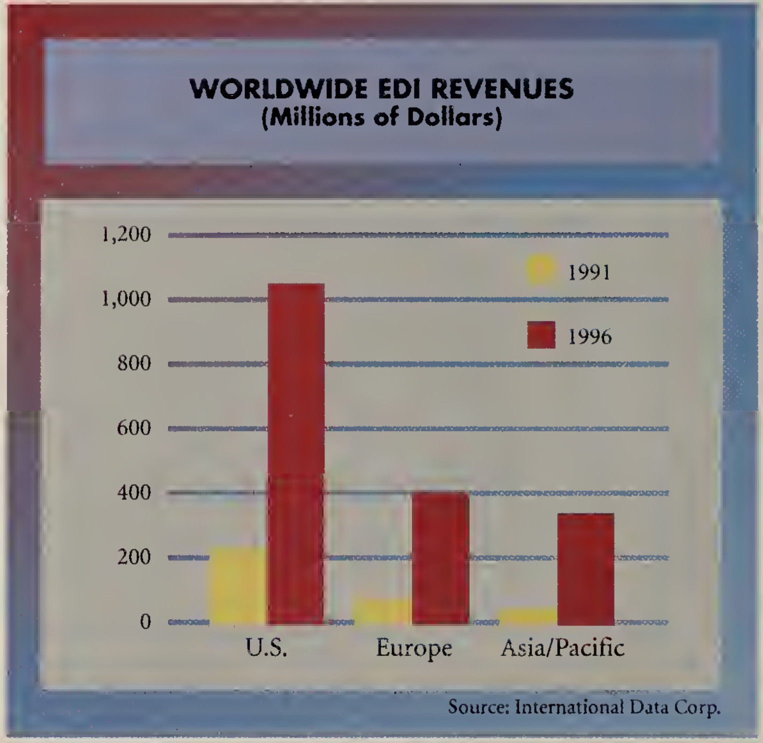
added, legacy systems (typically IBM and plug-compatible mainframes). This must be done in the face of new computing architectures, alternative software solutions, workgroup solutions and flexible infrastructures. At the same time, business management and IS are managing the ever-changing hierarchy of trading partner needs.



Source: International Data Corp.

Senior IS executives need to keep in mind that there is a wide diversity of technology experience and planned technology funding for EDI. Smaller spoke organizations typically underfund EDI and put EDI solutions on dedicated PC platforms. While this approach meets the hub requirements, it does not allow the spoke/supplier organizations to realize the full range of EDI benefits.

Some advanced technologies such as fax and imaging which contribute to expanding electronic commerce are not yet ready for interoperating with current systems at all levels. If any data from a fax or image transmission needs changing, the entire fax or image must be retransmitted. With EDI, changes can be made on a transaction basis. While fax and image systems are sometimes simpler to utilize, their data is not readily accessible for other applications. By comparison, EDI's business transaction set opens EDI data to a wide variety of uses.

Enabling application software that allows EDI systems to operate in a variety of trading environments is critical. IS has prior experience with DBMSs, as a requirement for flexible data management: CASE, as a requirement for quality application development; electronic mail, as a precursor for continuous office communications; and 4GLs, as a requirement for responsive decision support systems. Similarly, EDI is a requirement for managing the business organization for business process flexibility. As IS implementors understand, the challenge to building responsive systems is often directly related to the interfacing and interoperability functions.

## TWO UNDERLYING EDI THEMES

EDI is a response to two underlying business themes, time-based business solutions and stakeholder-responsive solutions. This is the implicit motivator shared by such diverse EDI organizations as the Big 3 automakers, Sears, McDonalds, UPS, transportation port authorities and the Department of Defense. When it comes to time-based business solutions, the Japanese have shown that companies can control markets if they can first control their own companies, squeezing down the cycle times to complete tasks, while still not losing quality or accuracy. This means reducing paper, handling, filing and storage. Perhaps most importantly, it means reducing barriers to moving information and physical goods.

Currently, there are two noteworthy business practices in the U.S. that are particularly productive corollaries of time-based management solutions. EDI is conducive to both of them. The first, Just-in-Time (JIT), is a manufacturing strategy designed to reduce physical inventory and its associated costs, while managing a smoother interface between manufacturers and suppliers. This has spurred increasingly productive approaches to factory layout and design, production lines, transportation, bar coding and distribution.

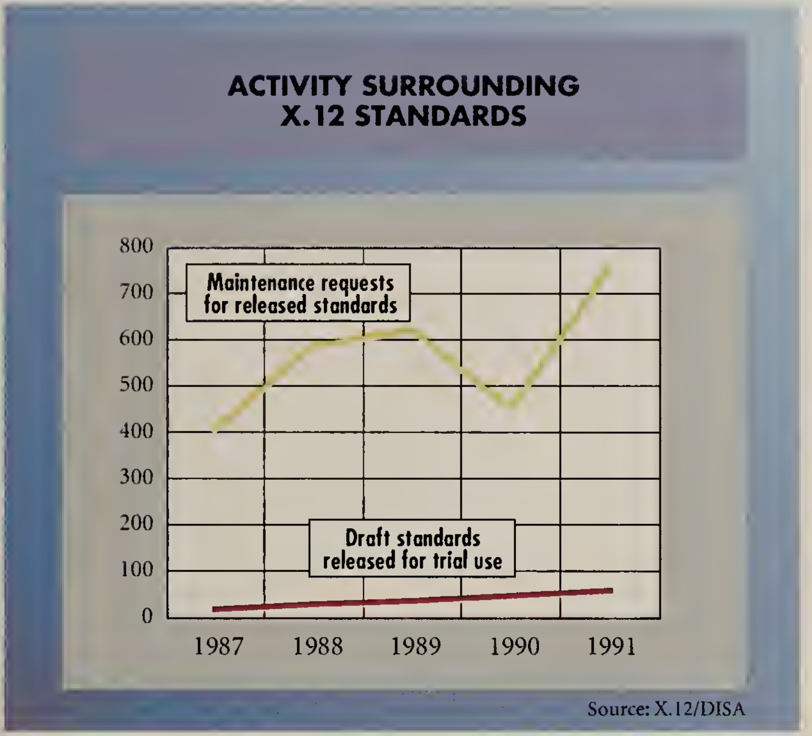
The second, Quick Response (QR), is a retail strategy, prominent in grocery/supermarket chains, designed to rapidly respond to customer buying patterns that are captured through point-of-sale (POS) checkouts. QR has led to such improvements as direct store deliveries, turnover management and earlier staging through advanced ship notices.

The ability to achieve best-in-class status, or even be recognized in an individual trading area as a company that other companies want to do business with, is a function of how well each company manages its separate audiences. These audiences consist of customers, suppliers, and employees. Since EDI establishes the infrastructure for electronic commerce by managing interfaces between companies, it improves stakeholder relations with customers and suppliers.

Managing the employee stakeholder is complex. Since EDI is almost always a change agent in the company, and since change is usually not comfortable for organizations, the scope, schedule and areas for application all require careful attention. Within many organizations, it is often the sales people who are the most concerned with the impact of EDI, since EDI forces them to become better business planners.

## CONCEPTUAL MODEL ARCHITECTURE

While EDI use is growing rapidly within a diverse community of private and public users, architectures and universally accepted and understood models have lagged. While this may not have



Source: X.12/DISA

hindered the rate of growth of EDI, it is becoming a more important issue as organizations work to achieve more critical paybacks from EDI.

It is also becoming more important for several other reasons.

- EDI is being deployed in a global environment marked by extreme differences in culture, business practices and approaches to problem solving
- More interactions are taking place outside an organization's primary trading group, with new partners, new practices and new language syntax
- The use of EDI as it relates to EFT and invoiceless payments is becoming more complex. This will force EDI hubs and spokes to communicate more precisely about critical points
- There is accelerating penetration of current EDI user organizations such as transportation companies, governmental agencies and banks. This means that education and training will grow in importance.

The initial development work for a conceptual model containing EDI standards and services was completed in mid-1991 by the Special Working Group on EDI under the auspices of the International Standards Organization. The objective of the group was not only to develop a conceptual model to identify and coordinate present and future standards and services, but to make it internationally acceptable.

## FOUR SUCCESS FACTORS

The four overarching critical success factors for EDI are business process reengineering; standardization and infrastructure; automation and flexible computing; and integration and interoperability.

### Business Process Engineering

The critical factor of business process reengineering, or redesign, was popularized by companies such as CSC/Index, Andersen Consulting, Ernst & Young and Nolan Norton. The approach is a methodical, often structured, approach to initiating fundamental organizational change by means of critically evaluating business activities. There is a discarding or reworking of ineffective or unessential processes. New approaches are built that utilize new technology, where appropriate, to achieve major breakthroughs in improved business performance.

Often the problems are larger than initially anticipated, since business problems do not usually fit into neat slots. For a computer systems manufacturer there may be multiple manufacturing systems, each having a different set of requirements, that need to be interfaced at different locations. For a large manufacturing plant there may be multiple power plants each with railroad sidings for coal delivery, and the need to differentiate and cost differently since they use different grades of coal.

In the drive to become more efficient and reduce expenses through EDI, inventory reduction is often a target. This example can be the cause of significant concern, especially for the plant manager who has the ultimate responsibility for operations at the plant level, and who may see himself and his safety stock as both a beneficiary of, and a captive to, JIT solutions.

### Standardization and Infrastructure

The first major area for standards involves messaging for the transaction transport and interchange over the communications network. The EDI roots for these are X.400 standards that were originally designed for electronic mail. The majority of current X.400 products is based on the version adopted in 1984. At that time, there was no explicit addressing of EDI requirements. Interim solutions have since been introduced by the National Institute of Standards and Technology (NIST) and the Consultative Committee for Telephone and Telegraph (CCITT).

The most critical EDI standards-related activity currently revolves around development of the X.435 standard, which facilitates EDI transactions over X.400 networks. X.435, which is still at least two years from implementation, defines a new EDI content type that uses the feature-laden services that are part of X.400. Additionally, as X.500-based directory services are better defined, the function of software translation and connectivity products for the deployment of EDI across networks will improve.

> *"Enabling application software that allows EDI systems to operate in a variety of trading environments is critical."*

As an interim measure toward achieving improved network interconnection, the ANSI X.12.56 Interconnect Mailbag structure is being implemented by value added networks (VANs). All major U.S. VANs are committed to a rapid implementation of the Mailbag

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standard with the goal of implementation by the end of 1992. This will improve transaction handling and message management. This is true even though Mailbag provides only one interconnection acknowledgement for multiple transmission steps, does not have full audit trail capabilities, and does not provide for real-time, event-driven EDI as does X.435.

The second major area for EDI standards is the content of the transaction or document itself. This is application oriented. Industry trade groups started by establishing their own standards to address their special needs. In the U.S. these standards now fall under the ANSI X12 umbrella. While over two-thirds of EDI users in the U.S. utilize the more generic X12 standard, many also still have unique requirements for subordinate special interest standards. Some of the established trading standards are: WINS for warehousing, UCS for supermarkets, TDCC for transportation, VICS for department stores/mass merchandisers and AIAG for automotive manufacturing.

> *"VANs must offer a high level of service, including effective help desks and rapid problem resolution."*

DISA has established uniform procedures for the adoption and distribution of standards, especially for groups of interested parties with structurally different business organizations. It is not likely that these diverse standards will ever be totally homogenized since trading groups always have unique business needs.

> *"Industry trade groups started by establishing their own standards to address their special needs."*

In addition to X12, there are primarily European standards that are being developed under the auspices of the United Nations and known as UN/EDIFACT (EDI for Administration, Commerce, and Trade), an upgrade to EDIFACT. The usage of the X12 and UN/EDIFACT standards are determined by the needs of trading partners. Although many EDI users do not have any current need for EDIFACT, it is nonetheless required for specific national agencies such as customs.

The UN/EDIFACT standards are not complete, and sometimes documentation is difficult to obtain. Because it is designed to meet generic global needs, it will evolve more slowly than X12 and may be more cumbersome.

It is important to note the U.S. federal government's EDI approach, Federal Information Processing Standard 161 (FIPS 161), was developed under the auspices of NIST. FIPS allows the use of either X12 or UN/EDIFACT. Both U.S. and European groups are working to get these two standards to align with each other within the next five years.

The open, conceptual model discussed earlier will be consistent with X12 and EDIFACT, since it does not plan to use specific syntax of either of these groups. This model could start EDI down a path toward a broad, unified methodology that will favor less sophisticated spoke users.

When discussing standards, be advised that trading sector standards may change as frequently as once or twice per year depending on each committee's actions and on the balloting by DISA membership.

The communication network is a very significant portion of the EDI infrastructure. As the most common EDI carriers, the VANs play a critical role in electronic data transport and interchange. Like standards, VANs often have a trading group heritage, although they have subsequently broadened considerably. For example, BT North America (the acquirer of Tymnet) has a background in the grocery area; TranSettlements has a transportation history.

Overall there are some dozen or so VANs active in providing both generic and specialized EDI services in the U.S. and Canada. They include GE Information Services (GEIS), IBM Information Network (IBM IN), AT&T, CANAC Telecom, Harbinger EDI Services, Infonet, Kleinschmidt, MCI, RAILINC, Sprint, Sears Communications, and Sterling ORDERNET.

The European and the Asia/Pacific markets are actually multiple country markets. The U.K. has the most well developed EDI infrastructure in Europe. In the U.K., International Network Services (INS), which is partly owned by GEIS, and AT&T/ISTEL are the leaders; in France, GSI, a leading European professional services company, and GEIS dominate. The German market is controlled by GEIS. EDI is moving at a slower pace in the other European countries.

In Asia/Pacific there is a two-tier market. Australia, New Zealand, Singapore and Hong Kong have well-developed EDI infrastructures. Japan, Taiwan, and South Korea have been late starters in EDI.

VANs are often the most practical, rapid and secure solution to communication network needs. There are three important areas for users to consider when evaluating networks for EDI use. The first is secure data transmission. It is necessary to know if data packets reach the trading partner quickly enough. Users also need to know what sort of functional acknowledgement capability has been established to provide an audit trail for the transactions. Beyond that, it is important to find out what backup and restart mechanisms are available when links or central offices are impaired.

It is also important to check out what type of archiving is provided and for how long. Are transactions just lost after one week? How well does the VAN plan and execute disaster recovery? When was the last time that disaster recovery was tested?

The second networking area to consider is interoperability. Since many trading partners will not be on the same VAN, interoperability between VANs and managing the security of the transactions over the multiple VANs is critical. These are the issues that the Mailbag protocol and X.435 are designed to solve.

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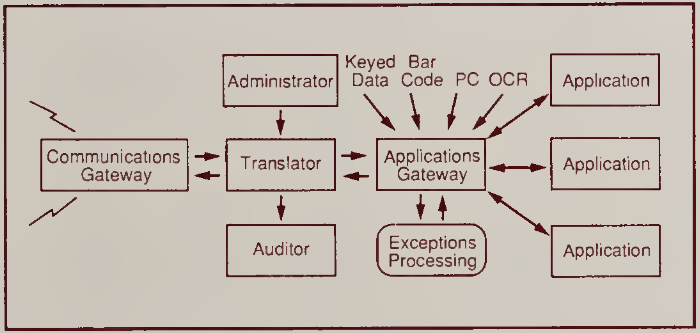

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## FOR HUBS

**Trading Partner PC Kits** are customized by TSI for *your* EDI program. And they're maintained by TSI as your program evolves.

Each Kit comes with all of the software and documentation your partners need for reliable, consistent trading. The benefits are clear — reduced effort for you and happy EDI partners at both ends.

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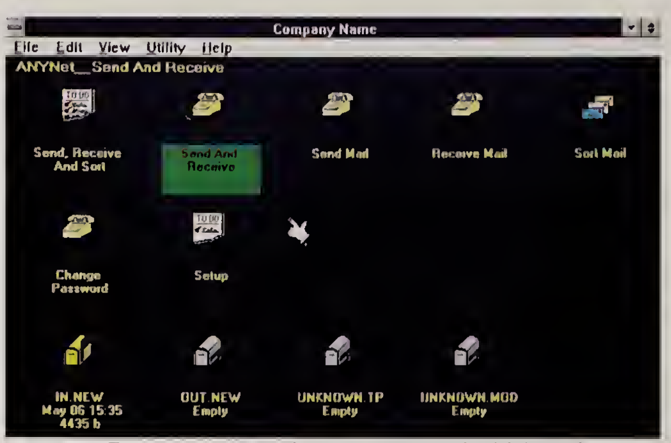
**Trading Partner PC** is the ideal blend of ease of use and power. Written to take advantage of Microsoft® Windows 3.0 and 3.1™, **Trading Partner PC** combines point-and-shoot graphics with high-performance EDI processing. It's a universal EDI platform for trading any document, on any network, with any trading partner.

For more information on **Trading Partner PC** or customized Kits for your EDI program, call **800-334-2120**.



*Trading Partner PC combines ease of use with high-performance EDI processing under Windows.*

® *Microsoft is a registered trademark and Windows is a trademark of Microsoft Corporation.*

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The third area is customer service. Some VANs still do not realize that there are usually no effective replacement and backup systems available for heavy EDI user companies. VANs must offer a high level of service, including effective help desks and rapid problem resolution. VANs need programs that rapidly profile trading partners for installation and modifications.

### Automation and Flexible Computing

The broad family of EDI software fits comfortably with a range of computer platform architectures, operating on mainframes, minicomputers and desktop (primarily DOS) machines. It can be used with both proprietary and UNIX environments. UNIX solutions have been emerging during the last two years. EDI translation software for standardized transaction sets is critically important. As the mission-critical nature of EDI evolves, organizations are making platform decisions that also include fault-tolerant machines. Both large and small organizations are purchasing EDI software.

Present computing platform usage is distinctly polarized. The larger Fortune 500 hub firms are operating in a mainframe environment often with software purchased from independent software vendors like Sterling, TSI, GEIS and IBM.

The spoke firms are typically operating on PCs or minicomputers. They may have only standalone PCs. EDI standards usually have been dictated by the larger hub firms and are predominantly based on X12. Small firms that use EDI only for the communications benefits will often translate and reassemble transactions for paper output delivery to departments such as purchasing, order entry, customer service, manufacturing or transportation/traffic.

Spoke software usually is chosen to be as compatible as possible with the requirements of hubs. Software suppliers focusing on the midrange and the desktop area include Supply Tech, ACS/Premenos, Digital Equipment, EDI Inc., EDS and Harbinger.

The larger hubs typically require rich product sets that accommodate scalability and address risk and reliability areas. The software needs to be table-driven. These tables must also address the evolving nature of X12, UN/EDIFACT and additional services such as bar coding that utilize online Universal Product Code tables.

The VANs also have complex software requirements for message and transaction management services. These services are required to maintain the integrity of the envelope and the transaction set. This integrity may have to be maintained across more than one VAN.

### Integration and Interoperability

Managing application integration and interoperability are also critical to EDI success. The term EDI II is used for systems that successfully realize this goal. The integration and interoperability areas have organizational, platform and software components associated with them. The organizational issues are very complex and largely applicable to business process reengineering. Hardware, standards and communications issues are primarily software issues.

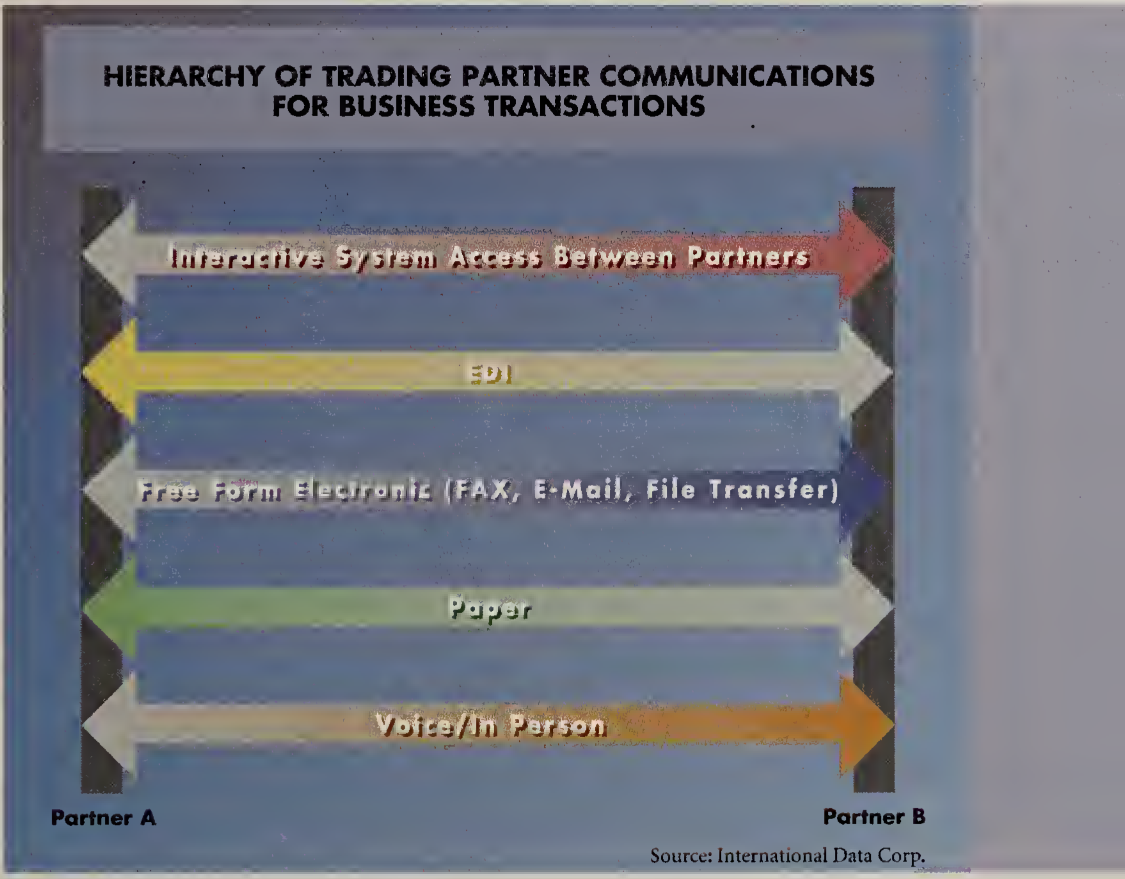
The more seamless and transparent EDI software is to other software, the easier it is to manage accompanying issues such as business reengineering. Software is improving in this area, but is not yet standardized. There are several areas that require special attention, including advanced software function, interoperability, network computing, convenient GUIs and time responsive solutions.

### THREE LEVELS OF EDI

There are three basic levels of EDI use: end-to-end communications, intraintegration and interexploitation.

Level 1 — End-to-end communications. This is the foundation installation of EDI. It is comprised of computing platform, translation software and communications links.

Usually PC-based, Level 1 includes an end-to-end transaction delivery system. This is the least expensive approach and accordingly offers the fewest benefits. Transactions received at this level may be keyed into other systems or

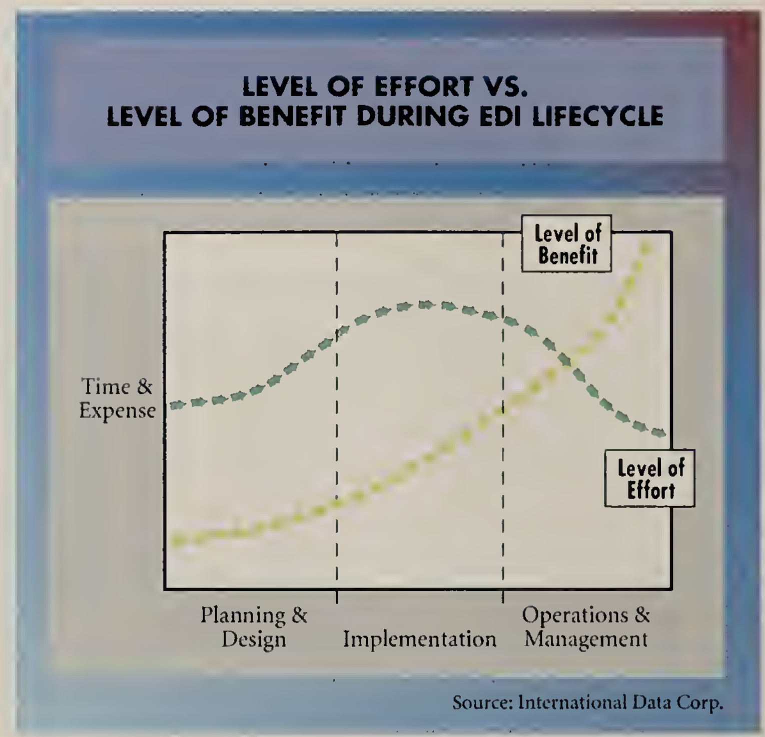

HIERARCHY OF TRADING PARTNER COMMUNICATIONS FOR BUSINESS TRANSACTIONS

Interactive System Access Between Partners
EDI
Free Form Electronic (FAX, E-Mail, File Transfer)
Paper
Voice/In Person
Partner A
Partner B

Source: International Data Corp.

turned into paper to be delivered to functional groups. There is no business process reengineering considered here.

The system is viewed by the organization as more of a communications link system than an IS system. Emphasis is on the trading partner-initiated aspects of the system. Usually it has been implemented to respond to a small number of trading partners and a limited number of business applications. Most EDI implementations are of a Level 1 type. Level 1 generally applies to smaller spoke companies as well as low end networks.


LEVEL OF EFFORT VS. LEVEL OF BENEFIT DURING EDI LIFECYCLE

Source: International Data Corp.

**Level 2 — Intraintegration.** This represents a Level 1 system that interoperates and is integrated with other IS systems. The Level 2 system affects business operations and has a high likelihood to change business practices. Business process reengineering is likely to have occurred at this level. Application integration and interoperability with other systems are the primary characteristics of this EDI level. It is a moderately expensive solution and has the potential for significant benefits when business processes are considered.

The Level 2 system impacts intracompany activities most heavily. Usually a larger number — perhaps hundreds — of trading partners is involved. Level 2 systems have the potential to be mission-critical. Level 2 approaches may extend JIT or QR across the business organization. These implementations are mostly being performed by hub organizations on mainframe systems.

**Level 3 — Interexploitation.** This is a Level 2 system that is more thoroughly integrated with business practices on both ends of the communication link. Level 3 systems are expensive and need to be implemented carefully over time. Their benefits can be very significant. The trading partners are providing information to each other that was formerly classified as internal information only. For example, a supermarket is sharing its anticipated shelf withdrawals and special promotions with manufacturers who will use the information for their manufacturing production planning schedules.

This level allows trading partners to plan ahead for materials, machine time, capacity and people needed in the future. Level 3 systems are mission-critical systems. Only a few trading operations have achieved Level 3. This group includes a number of transportation companies that have integrated systems with their customers' needs. These systems require trust between partners.

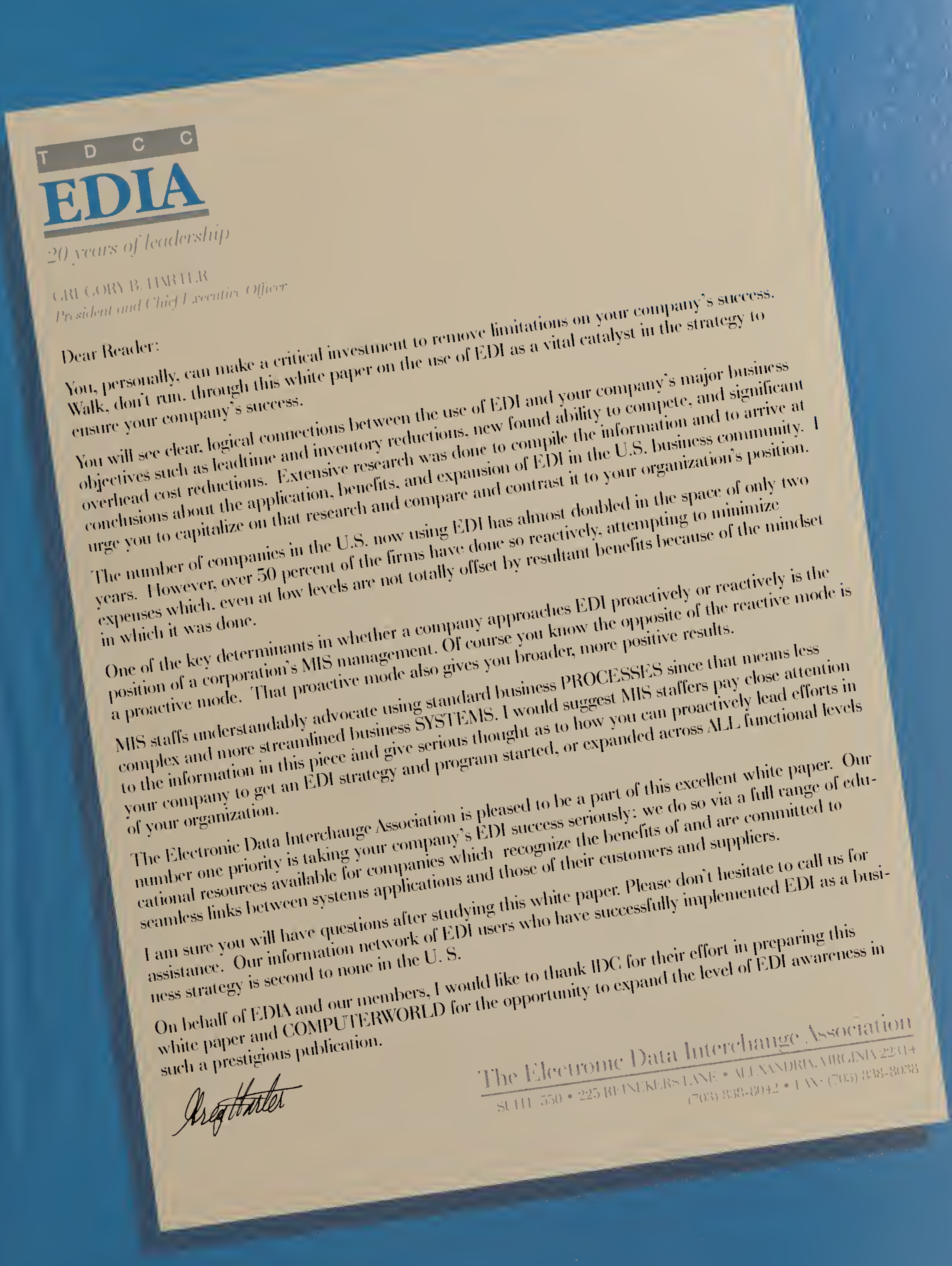
## FUTURE EDI DIRECTIONS

While EDI will be more successful if integrated with present application software solutions as Level 2 EDI applications, the most lucrative EDI payoffs will come from finding new ways of doing business. Examples may include tieing EDI directly to scanners to take advantage of bar code inputs, or reducing complexity of purchasing systems by building advanced shipment solutions that require only P.O. release numbers.

Another example may be simplifying payments to trading partners with advanced receipt and settlement systems. These systems will maintain tight audit trails but, let workers focus on system effectiveness rather than system efficiency.

Currently it is common to schedule batch EDI applications at various times. In some industries this batch orientation will change to real-time and event-driven transmissions that require the time-critical capabilities of EDI.

Although communication carriers such as AT&T, MCI, Sprint and the regional Bell operating companies are in their early startup stages for EDI, VANs may expect greater competition here once the carriers better understand the requirements of EDI. There is a challenge to carriers to become more than just a voice or data communications network offering customers wide area connections. Carriers have the opportunity to become more deeply associated with customers and their business activities by managing EDI transaction sets. They also have the opportunity to provide enhanced services that extend present voice and data communications infrastructures and offerings significantly.



T D C C
EDIA
*20 years of leadership*

GREGORY B. HARTER
*President and Chief Executive Officer*

Dear Reader:

You, personally, can make a critical investment to remove limitations on your company's success. Walk, don't run, through this white paper on the use of EDI as a vital catalyst in the strategy to ensure your company's success.

You will see clear, logical connections between the use of EDI and your company's major business objectives such as leadtime and inventory reductions, new found ability to compete, and significant overhead cost reductions. Extensive research was done to compile the information and to arrive at conclusions about the application, benefits, and expansion of EDI in the U.S. business community. I urge you to capitalize on that research and compare and contrast it to your organization's position.

The number of companies in the U.S. now using EDI has almost doubled in the space of only two years. However, over 50 percent of the firms have done so reactively, attempting to minimize expenses which, even at low levels are not totally offset by resultant benefits because of the mindset in which it was done.

One of the key determinants in whether a company approaches EDI proactively or reactively is the position of a corporation's MIS management. Of course you know the opposite of the reactive mode is a proactive mode. That proactive mode also gives you broader, more positive results.

MIS staffs understandably advocate using standard business PROCESSES since that means less complex and more streamlined business SYSTEMS. I would suggest MIS staffers pay close attention to the information in this piece and give serious thought as to how you can proactively lead efforts in your company to get an EDI strategy and program started, or expanded across ALL functional levels of your organization.

The Electronic Data Interchange Association is pleased to be a part of this excellent white paper. Our number one priority is taking your company's EDI success seriously; we do so via a full range of educational resources available for companies which recognize the benefits of and are committed to seamless links between systems applications and those of their customers and suppliers.

I am sure you will have questions after studying this white paper. Please don't hesitate to call us for assistance. Our information network of EDI users who have successfully implemented EDI as a business strategy is second to none in the U. S.

On behalf of EDIA and our members, I would like to thank IDC for their effort in preparing this white paper and COMPUTERWORLD for the opportunity to expand the level of EDI awareness in such a prestigious publication.

Greg Harter

The Electronic Data Interchange Association
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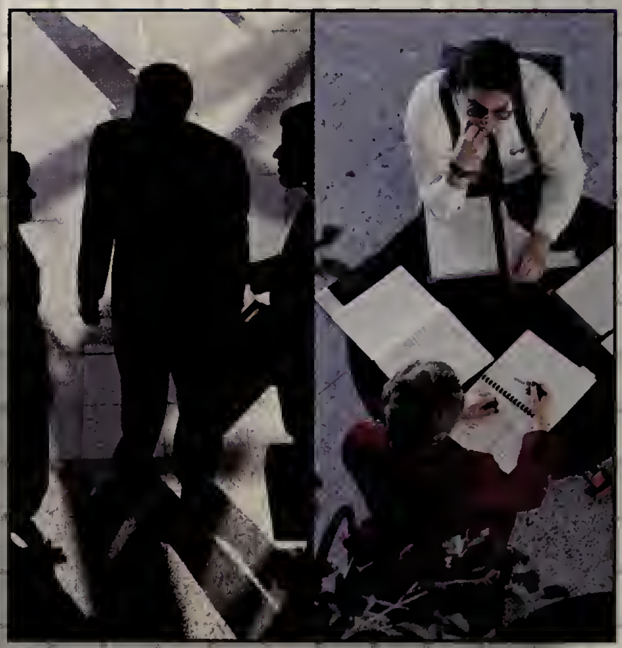

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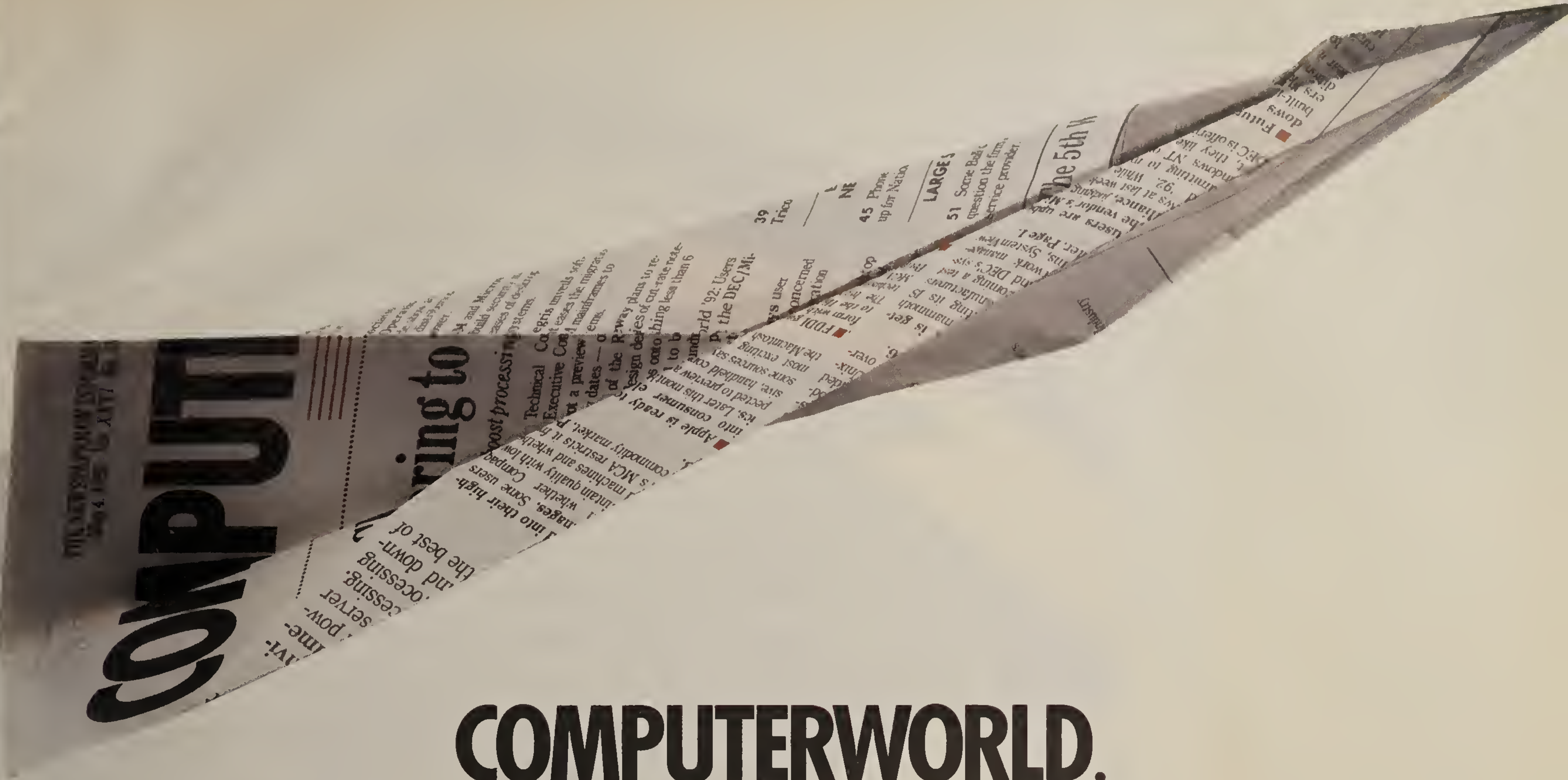

# COMPUTERWORLD.

## The Nonstop Computer Newspaper That Works for You.

**8:12 a.m., Thursday.** News Editor Alan Alper and Assistant News Editor Patricia Keefe meet at the Framingham home office to review the hottest news that's come in during the week from all over the world.

**1:58 p.m.** Stories continue to pour in. Alper meets with top editors and production people to map out the 12 late-breaking news pages. Art Director Nancy Kowal presents ideas for visuals that will bring the news stories to life.

**6:09 p.m.** Tokyo Correspondent Lori Valigfa receives a hot tip on a new technical advance in active matrix displays for PC's. She calls her sources in Japan to check out the rumor.

**10:37 p.m.** Alper, Keefe, and staff finish editing the final stories, clean up the pizza boxes, soda cans and shut down for the night.

**8:02 a.m., Friday.** The *Computerworld* staff filters into headquarters for the final push. Finished layouts must be at the printer by the end of day to make the deadline.

**10:32 a.m.** Maryfran Johnson, Senior Editor, transmits a story from the IBM Scientific Computing Conference in Palm Springs. IBM has announced the details of a major advance in RISC-based processing.

**12:48 p.m.** Midwest Bureau Chief Ellis Booker puts the finishing touches on a story about the first user of NCR's new parallel high-end processing system.

**5:37 p.m.** Electronic transmission of the latest news in IS is complete. The current issue of *Computerworld* is on its way to you.

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What's more from the time your issue rolls off the presses at midnight on Friday, it takes some 25 airplanes, 5 trains, 7 tractor trailer trucks, and 37 major city postal centers to deliver *Computerworld* to your desk by Monday morning.

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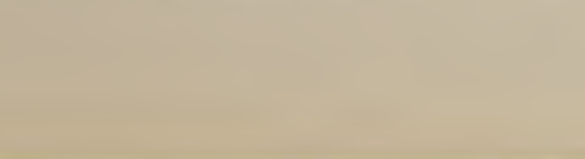

COMPUTERWORLD

INSIDE OS/2, Unix facing net clash PS/2 tries

The Newspaper of IS

*In Canada, call 1 800 465-7999 **Upgrade from Windows, $79; upgrade from DOS, $99; $149 base operating system. These prices valid only when ordered directly through IBM. Proof of purchase required. Dealer prices may vary. Offer valid in U.S.A. only, expires 10/31/92. Shipping and handling not included. IBM and OS/2 are registered trademarks and OS/2 Crash Protection is a trademark of International Business Machines Corporation. Windows is a trademark of Microsoft Corporation and Adobe Type Manager is a registered trademark of Adobe Systems Incorporated. © 1992 IBM Corp.

# With OS/2 2.0, you won't need one of these.

If you run more than one application at a time with DOS and Windows™, brace yourself. When one application fails, the entire system can fail. It's called a crash, but most people call it worse than that. Because each time it happens, you have to reboot your computer. If you didn't save what you were working on, you simply have to do it again. So every crash could be a huge crush. And a huge waste of time.

OS/2® 2.0 is different, because OS/2 Crash Protection™ helps shield applications from each other. In other words, each running application is self-contained, so if one goes down it won't affect the others or the operating system. No frequent systemwide crashes like in Windows. So you won't lose all your valuable work. Not to mention time. And OS/2 can also save you money, because for less than the cost of DOS and Windows, you get the capabilities of both. Plus all the added benefits of OS/2 2.0—including Adobe Type Manager.®

OS/2 2.0 lets you work like you never could before. And OS/2 Crash Protection helps keep it all from coming to a crashing halt. For an IBM authorized dealer near you, or to order OS/2 2.0 from IBM—at special promotional prices of $79 for Windows users and $99 from any DOS—call **1 800 3-IBM-OS2.***

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- *OS/2 Crash Protection helps shield applications from each other.*
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IBM

# Factory ferrets out inadequacies

*Says increase of viruses warrants new generation of scanners*

BY JAMES DALY
CW STAFF

A Thailand security company has produced a self-described "virus factory" that may force computer owners to rethink the way they detect and eliminate viruses.

A spokesman for Bangkok Security Associates said the company's Project XVIR can double the number of known computer virus variants in one two-hour stretch — faster than any standard antivirus program that scans for known viruses can possibly keep up.

Bangkok Security chief programmer John DeHaven said the purpose of the demonstration was not to scare the wits out of those in charge of information systems security but to show that the primary passive inspection methods of looking for strings of known virus code are seriously flawed.

### No gimmick

"This is not a trick, and it is not superprogramming," said DeHaven, who demonstrated Project XVIR at the recent International Virus Prevention Conference in Arlington, Va. "It is something that we would fully expect a virus writer or malicious individual to do."

Although antivirus experts have claimed the existence of about 1,200 known viruses and variants prior to the experiment, Project XVIR can produce up to 600 viruses per hour. Each one possesses a 1-byte modification of the prevalent Jerusalem-B virus and is distinct from every other one produced, DeHaven said.

The traditional method used by scanners to ferret out malicious code is to look for strings of code inherent in particular viruses. But the increasing prevalence of mutated viruses has precipitated a new generation of scanners that look for both suspicious code and irregular code behavior.

### Raising alarms

These detection methods typically involve simple internal self-consistency checks. When the application is launched, these checks are made as part of the start-up procedure. If the checks fail, it means the application has been modified, perhaps by a virus, and an alarm is raised.

Some applications of this type include Untouchable, Microcom, Inc.'s Virex and F-PROT, which is available for a small fee on many bulletin boards.

DeHaven said Project XVIR's goal is "to help return the battle against computer viruses to its proper track. The nonexpert . . . has been led down a wrong road by stop-gap measures to determine the presence of viruses."

DeHaven added that when experts claim that virus scanning for specific viruses is the wave of the future, "then something is desperately and depressingly wrong in the antivirus community."

Bangkok Security's message has not fallen on deaf ears. Several creators of virus detection packages already integrate features that look for virus-like behavior rather than strings of virus code.

"The days of checking for virus signatures are over," said Vicky Gore, senior product marketing manager at Baton Rouge, La.-based Fifth Generation Systems, Inc., which produces the Untouchable package.

# HELP LINE

## IBM OS/2

*Part of a series of user tips provided by personal computer software vendors, based on questions commonly asked of their customer support personnel. This week's focus is on IBM's OS/2 2.0.*

**Q Should I use the High Performance File System (HPFS) or should I stick with file allocation tables (FAT)?**

A There are two things to consider with HPFS. First, if you plan on using the feature of OS/2 that allows you to boot DOS by itself, not within a DOS session under OS/2, then you should stick with FAT on the boot drive and any drives you want to access within DOS applications.

The other consideration is memory. If you have less than 8M bytes of memory in your computer, you should seriously consider staying with FAT, as HPFS uses 500K bytes of memory. If you have 8M bytes of memory or more and your disk is larger than 60M bytes, you will be better off with HPFS.

**Q I want to install something similar to HPFS support, which I did not choose when I installed OS/2. Do I have to start my installation over?**

A No. Simply open the OS/2 System Folder by double clicking on it, then open the System Setup object. You can then choose Selective Install, which will allow you to install any feature you did not choose initially.

**Q My printer worked fine under DOS but now will not work under OS/2. What should I do?**

A There are several things that OS/2 does with printing that DOS did not. You will need to ensure that your system is configured so that your printer port is on IRQ7 and your second printer port is on IRQ5. You will also need to ensure that the address on LPT1 is either 3BC or 378 and LPT2 is address 278.

**Q I have heard about BIOS dates and how some older machines will not run OS/2 unless I have an up-to-date BIOS. What are the right levels?**

A There are several manufacturers of BIOS chips that require certain levels to run OS/2. Any IBM Personal System/2 with an Intel Corp. 80386SX chip or higher will run OS/2 with no problems. The information below describes the BIOS makers and BIOS levels we know about:

American Megatrends, Inc. (AMI) BIOS — For AMI BIOS machines, the revision number will be displayed while the memory is counting and will look like this:

aaaa-bbbb-mmddyy-Kc for AMI BIOS and AMI BIOS Plus.

ee-ffff-bbbbbb-gggggggg-mmddyy-hhhhhhhh-c for AMI Hi-Flex BIOS.

If the ID looks any different, then you need to contact the system board manufacturer.

If you have an IDE-type hard disk, the "mmddyy" above should be 040990 or later. With any other type of hard drive, the "mmddyy" above must be 092588 or later, along with the keyboard controller at revision level (the "c" in the codes above) F. This is necessary for OS/2 2.0 to function correctly.

The ID codes above may indicate you should contact your system board manufacturer for upgrade information for running OS/2 2.0. If the ID codes on your system conform to the above and you need a BIOS update to run OS/2 2.0, you can contact Washburn & Co. at (716) 248-3627 for upgrade information.

Phoenix Technologies, Inc. BIOS — If your system has a Phoenix BIOS, it must be at Revision level 1.02.05D or later for OS/2 2.0 to operate properly.

## NEW PRODUCTS

### Software application packages

The Aldridge Co. has introduced Version 4.0 of its Tree86 file management program.

According to the company, the product is Microsoft Corp. Windows-compatible and offers support for large drives of up to 16,000 files and 2,000 directories. Version 4.0 has a variety of new features, including the ability to execute operations across drives as if they were one unit and a configuration option for compact disc/read-only memory.

Tree86 costs $89.95

**Aldridge
Suite 575
2500 CityWest Blvd.
Houston, Texas 77042
(713) 953-1940**

Bullseye Systems has announced Info-Cady, a document organizing system. The product was designed for personal computer users who need to organize the abundance of documents and information that they receive on a daily basis.

User-defined pop-up menus, keyed fields and default auto-generated fields enable the user to input the information. Several search parameters such as title, subject, author or location can identify the information.

Info-Cady costs $99 for a single user and $149 when it is networked.

**Bullseye Systems
2268 Westmoreland Drive
San Jose, Calif. 95124
(408) 266-9226**

Molecular Arts Corp. has introduced ChemExhibit, Microsoft Corp. Windows-based software.

Version 1.1 of ChemExhibit is a desktop tool designed for users in chemical research. Users can manipulate, display and render three-dimensional molecular structures, create 2-D chemical diagrams and publication-quality graphic illustrations.

The product can also import graphic images from third-party applications and record the results. Several features have been added to this release, including Chemgram, advanced 2-D chemical diagram drawing tools and Zoomin, a 3-D molecular structure magnification and higlighting tool.

A single-user industrial license costs $595.

**Molecular Arts
1532 E. Katella Ave.
Anaheim, Calif. 92805
(714) 634-8100**

### Utilities

Visual Software, Inc. has announced Version 2.0 of Renderize for Windows.

The product is a photo-realistic, three-dimensional, image-rendering utility designed for Microsoft Corp.'s Windows. The company's graphical user interface allows users to create 3-D wireframe models, producing full-color, photo-realistic designs that are ready for hard-copy output. Version 2.0 offers directed environment mapping and features enhanced image-processing capabilities, transparency mapping and improvements in object/camera view positioning.

Version 2.0 of Renderize for Windows costs $895.

**Visual Software
Suite 310
21731 Ventura Blvd.
Woodland Hills, Calif.
91364
(818) 883-7900**

### Macintosh products

Envisio, Inc. has introduced ColorFrame, a flat-panel color display for the Apple Computer, Inc. Macintosh.

According to the company, the active-matrix display in ColorFrame refreshes faster than ordinary LCD panels. Problems such as ghosting and submarining are eliminated by the quicker response time. A portable presentation system can be created when the product is combined with the Macintosh Powerbook and Envisio's Notebook Display Adapter/030.

ColorFrame costs $5,495.

**Envisio
Suite 303
510 First Ave. N.
Minneapolis, Minn. 55403
(612) 339-1008**

Helix Technologies has announed Helix Tracker Version 1.0, a work-flow and document management product for the Apple Computer, Inc. Macintosh.

The product enables users to facilitate document routing, assign tasks and priorities and track and schedule projects and deadlines. Helix Tracker also allows users to control document versions and store and retrieve documents in a nonproprietary client/server environment. Support for a server and four client workstations is provided by client/server software included in the product.

Helix Tracker costs $739.

**Helix Technologies
4100 Commercial Ave.
Northbrook, Ill. 60062
(708) 205-1669**

Santos Technology, Inc. has announced Mira 35.

The Mira 35 is a slide scanner that was designed for the Apple Computer, Inc. Macintosh LC and II series computers running System 6.05 or higher.

According to the company, the Mira 35 offers single-pass 2,700 dot/in. resolution and can

*Continued on page 57*

# When you spend ten years designing spreadsheets, you get pretty good at filling in the rows and columns.

While this is old news to the nearly 18 million people who use 1-2-3,® it bears repeating: according to a recent ComputerWorld study for spreadsheets, Lotus® is still the company people prefer to do business with. And still the company that offers the best service and support–across all major platforms.

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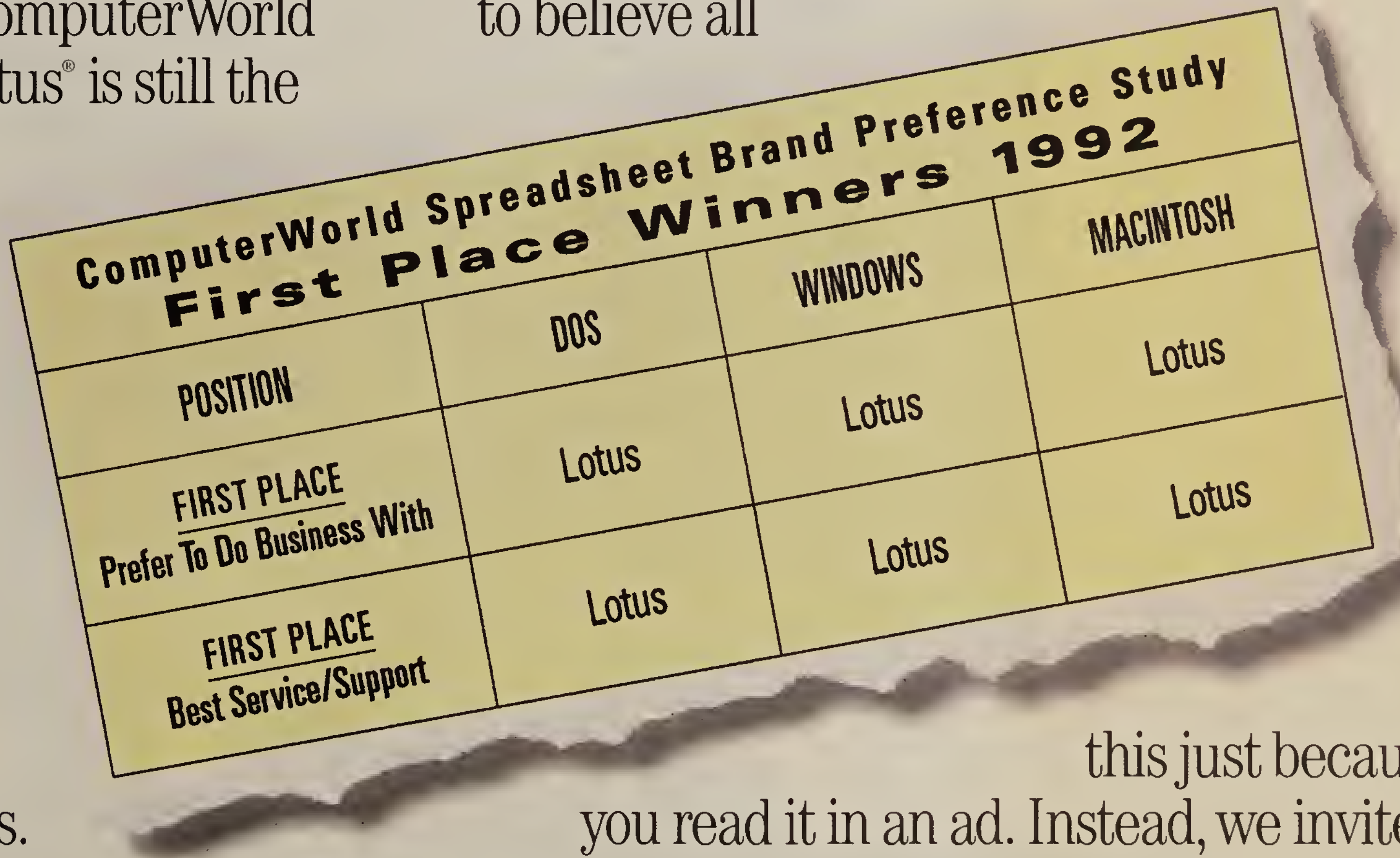

ComputerWorld Spreadsheet Brand Preference Study
First Place Winners 1992

| POSITION | DOS | WINDOWS | MACINTOSH |
|---|---|---|---|
| FIRST PLACE<br>Prefer To Do Business With | Lotus | Lotus | Lotus |
| FIRST PLACE<br>Best Service/Support | Lotus | Lotus | Lotus |

Lotus. Still on the top of the charts.

**Lotus 1-2-3**

*Based on Software Publishers Association share data, May 1992, for North America. **In Canada, call 1-800-GO-LOTUS. ***While supplies last. Demo disk not available for palmtop version of 1-2-3. ©1992 Lotus Development Corporation. All rights reserved. Lotus and 1-2-3 are registered trademarks of Lotus Development Corporation. Windows is a trademark of Microsoft Corporation. Macintosh is a registered trademark of Apple Computer, Incorporated. OS/2 is a registered trademark of International Business Machines Corporation. UNIX is a trademark of UNIX Systems Laboratories, Inc.

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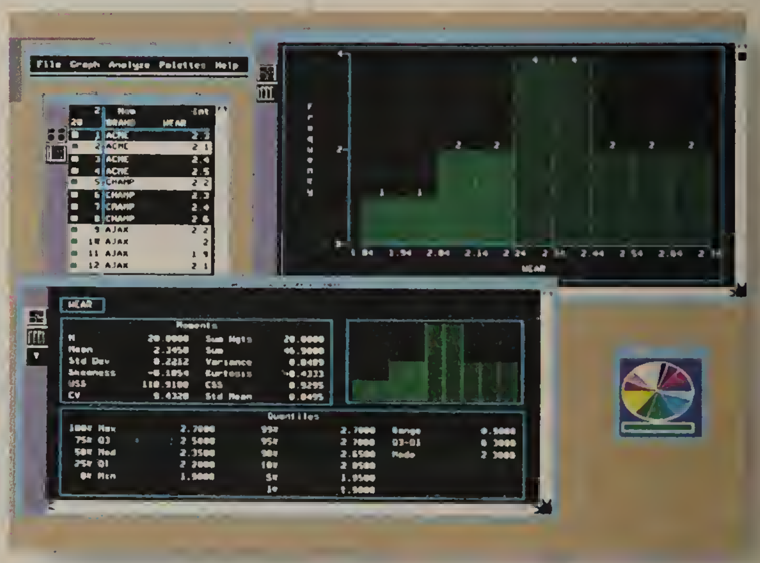

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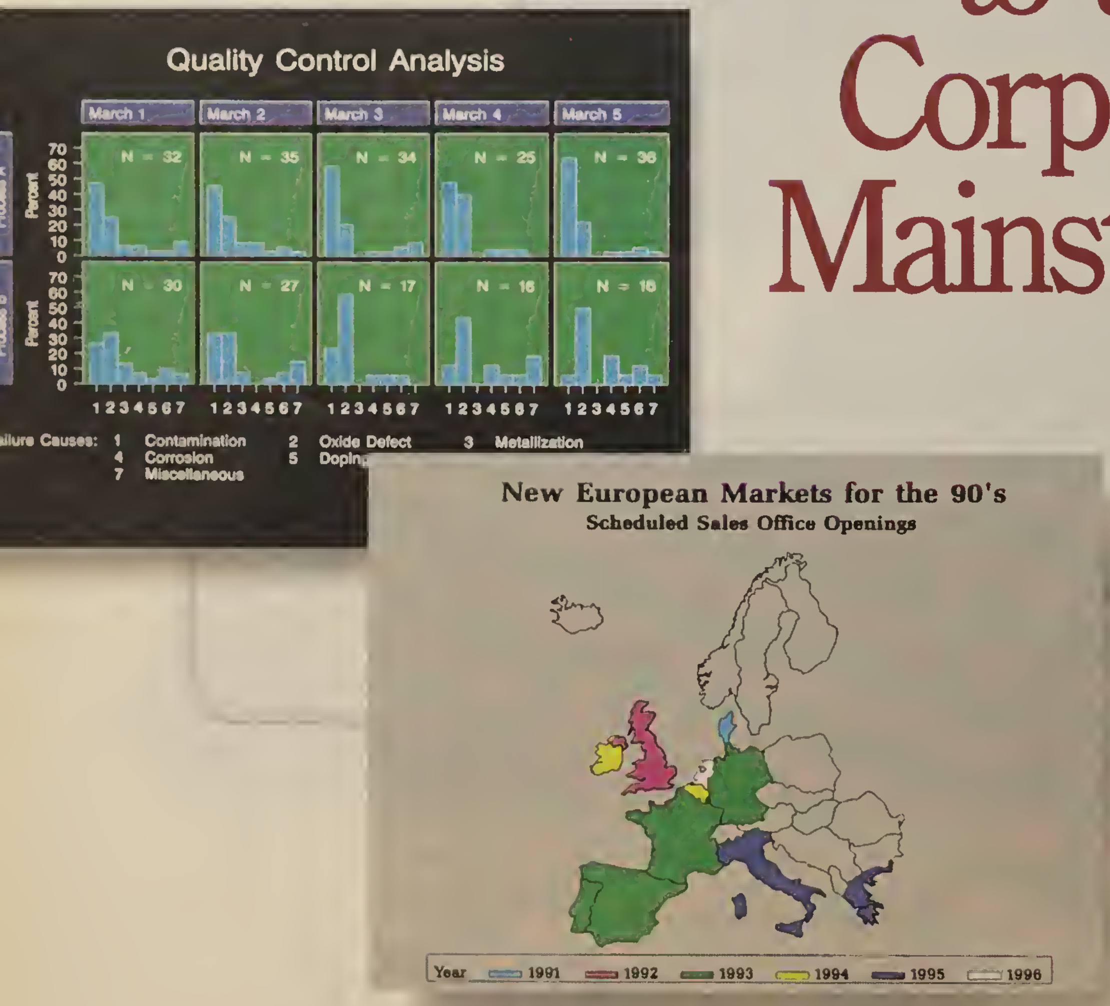

Marketing

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SAS Campus Drive ☐ Cary, NC 27513
Phone 919-677-8200 ☐ Fax 919-677-8123

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The SAS System runs on mainframes, minicomputers, workstations, and personal computers.
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*Continued from page 52*

capture color or monochrome images from any positive or negative 35mm slide or film. The product is bundled with Santos Technology's Mira 35 plug-in module software.

Mira 35 costs $2,695.

**Santos Technology**
**Suite 1604**
**383 Van Ness Ave.**
**Torrance, Calif. 90501**
**(310) 320-8888**

## Peripherals

Altra has introduced Felix for Windows, a compact desktop pointing device.

Felix is an alternative to the typical computer mouse. It can be used across a range of applications such as desktop publishing, word processing, graphics and spreadsheets. An on-board microprocessor controls Felix's optical pointing technology.

Felix was ergonomically designed and can help prevent injuries such as carpal tunnel syndrome, the company reported.

Felix for Windows costs $129.

**Altra**
**520 W. Cedar St.**
**Rawlins, Wyo. 82301**
**(307) 328-1342**

Visionetics International Corp. has introduced VIGA+, a real-time image-capture board for IBM Personal Computers and compatibles.

VIGA+ was designed for Extended Industry Standard Architecture and PC XT/AT bus systems. The product occupies a single slot and has new Video Graphics Array and Extended Graphics Array overlay and pass-through features. VIGA+ performs digital special effects processing. With this process, users can do cross-fading and linear blending between different images and video sources.

Prices for VIGA+ range from $1,395 to $1,895.

**Visionetics International**
**Suite 300**
**21311 Hawthorne Blvd.**
**Torrance, Calif. 90503**
**(310) 316-7940**

Microfield Graphics, Inc. has introduced the X8 Color Graphics controller.

The X8 Color Graphics controller was designed for the X Window System and Microsoft Corp. Windows environments. According to the company, the product turns PC XT/AT and Extended Industry Standard Architecture bus-compatible personal computers into high-performance, high-resolution color workstations.

The X8 Color Graphics controller can transfer a 1,280- by 1,024-pixel image in a quarter of a second to the display on the XT/AT bus. The product performs block logical transfer operations at 23 pixel/sec. for moving picture elements such as icons and windows across the screen.

The graphics controller costs $2,995.

**Microfield Graphics**
**9825 SW Sunshine Court**
**Beaverton, Ore. 97005**
**(503) 626-9393**

## Database management

Ace Software Corp. has introduced AceFile 2.0, a nontechnical database manager for the Microsoft Corp. Windows environment.

Version 2.0 has a new tool bar that lets users invoke functions that are used most often by clicking on an icon. The product can include bit-mapped graphics on every form, report or label that it generates and allows the images to be scanned in or imported from another program.

The product costs $199.

**Ace Software**
**Suite 680**
**1740 Technology Drive**
**San Jose, Calif. 95110**
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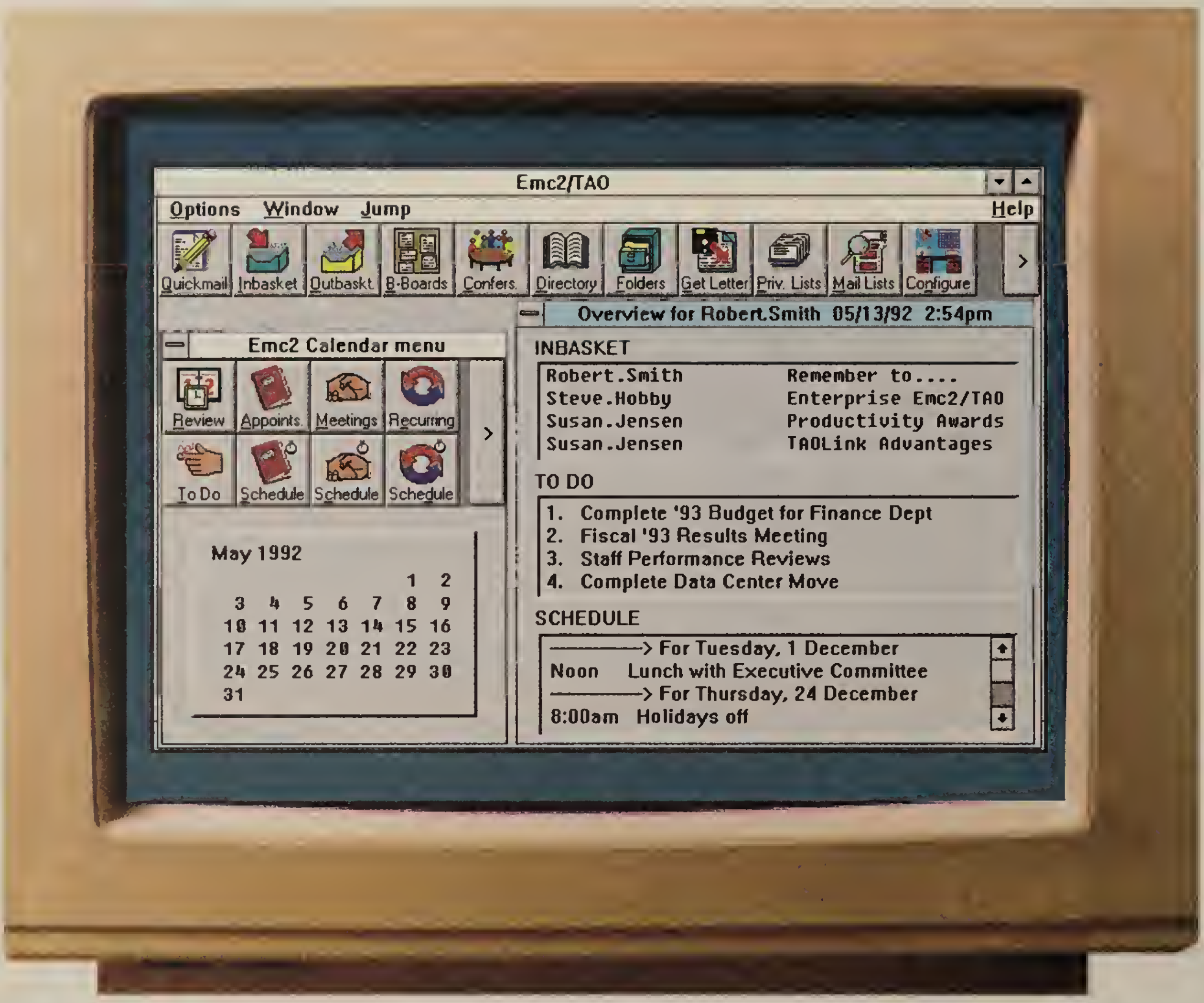

May 1992

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Overview for Robert.Smith 05/13/92 2:54pm

INBASKET

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|---|---|
| Robert.Smith | Remember to.... |
| Steve.Hobby | Enterprise Emc2/TAO |
| Susan.Jensen | Productivity Awards |
| Susan.Jensen | TAOLink Advantages |

TO DO

1. Complete '93 Budget for Finance Dept
2. Fiscal '93 Results Meeting
3. Staff Performance Reviews
4. Complete Data Center Move

SCHEDULE

————> For Tuesday, 1 December
Noon Lunch with Executive Committee
————> For Thursday, 24 December
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# WORKGROUP COMPUTING

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## Client/server on track at railroad

BY GARY H. ANTHES
CW STAFF

FORT WORTH, Texas — "You'd have to see our mainframe to believe it," said James L. Shefelbine, a planning specialist at Burlington Northern Railroad. "It's to the point where you can submit a screen change and go and get a cup of coffee, and when you come back it still might not be done."

But now some of the interactive requests that took five to 10 minutes on the mainframe are being cranked out on an IBM RISC System/6000 server and delivered to users' desktops in 15 to 30 seconds.

The railroad has just put into production its first application for the Unix-based client/server environment, which seems likely to steal a number of mission-critical applications from the sluggish, glass-house machines — an Amdahl Corp. 1400A and an 1100A. The applications allow 40 to 50 railroad operations specialists to schedule trains and optimize their movement over 25,000 miles of track and through 8,000 terminals and stations across the country.

"We'd do number-crunching [on the mainframe] for days and weeks on end," Shefelbine explained. "But for writing interactive applications, for doing graphics and for being user-friendly, the mainframe was a terrible environment for us."

He said the more friendly client/server environment has boosted development productivity by 85% to 100%.

On a local-area network here, Microsoft Corp. Windows-based personal computers talk to the Unix (IBM AIX) box using Sun Microsystems, Inc.'s PC-Network File System for communication and Xvision, an X Window System-based tool from Visionware Ltd. in Leeds, England. Operations research models can be initiated on the RS/6000 from the PCs and the results brought back for inclusion in a document or spreadsheet window.

Burlington Northern is working with operations research experts at IBM to develop new models that will, for example, allow train schedulers to perform what-if analyses to predict the effects of alternate train movements. Those models, which will be very complex and highly optimized for efficiency, will be written in C and will take five to 10 years to perfect, Shefelbine said.

In the meantime, the railroad is writing new applications — and porting or rewriting old mainframe ones — in software from SAS Institute, Inc. in Cary, N.C. "We use SAS because it has the graphics, the statistical analyses and the operations research under one umbrella. We can throw code together very quickly and very inexpensively," Shefelbine said.

He said the use of PCs — let alone client/server computing — is a relative novelty at Burlington Northern, having really caught on just this year. "It's very political. The [data processing] department is very, very powerful, and they like owning the computer you work on," he said.

But the end-user computing dam has apparently burst at last. "So much of our analysis is now leaning toward the PC side, with enormous amounts of spreadsheets, presentations, graphics. PCs were rare, but now we'll take any PC we can get," he said.

In the current setup, Shefelbine's group runs a monthly

*Continued on page 64*

**ON SITE**

**Burlington
Northern Railroad**
*Fort Worth, Texas*

- **Challenge:** To improve poor graphics and excruciatingly slow turnaround on mainframe-based railroad modeling and scheduling applications.
- **Solution:** Port compute-intensive applications to IBM RS/6000s running AIX; give users PCs and access to the applications, written with tools from SAS Institute, Inc.
- **Results:** Development productivity boosted 85% to 100%; runtimes reduced; users enjoy all the functionality of modern PC software.

## Texaco finds rewards, challenges in groupware

### *Uses workgroup approach to tackle integration*

BY ROSEMARY HAMILTON
CW STAFF

When it comes to groupware, Texaco, Inc. could be considered an old-timer. It has a good six years of research and implementation behind it.

And, as is often the case, the years of experience point out how much more there is to learn.

"I believe it is enabling us to do things that we couldn't do before," said Brad Jackson, assistant to the general manager in the corporate information technology department. "It's breaking the barriers of time, geography and group size."

Yet he is also quick to point out that there is more to groupware than the products. It is a far cry from populating a user base with such productivity tools as spreadsheets. To Texaco, groupware is more an approach to computing, and it raises as many organization and human behavior challenges as it does technology issues.

STRUCTURE ALONE DOES not resolve the human issues of workgroup computing.

Currently, Texaco uses Lotus Development Corp.'s Notes as well as other products, including Software Aided Meeting Management (SAMM), a tool from the University of Minnesota that is not commercially available. In addition, Texaco works with other products under development, although Jackson declined to name the software companies.

Jackson said Texaco is still studying the effects the technology has on teams. Initial implementations are now behind it, so the biggest groupware challenge facing Texaco is integration, he said. While this includes integrating groupware products, it also means integrating the workgroup approach to Texaco.

As part of a total quality initiative, which began in the mid-1980s, each division of the corporation adopted quality programs; in some cases, that included team management. But that structure alone does not resolve the human issues of workgroup computing. For example, Jackson said, some end users adapt quickly to Lotus' Notes. "They see it and they click

*Continued on page 61*

By the end of this week Computerworld readers will have spent over $56.1 Billion on Information Technology this year – representing nearly half of all IT spending to date in 1992.

COMPUTERWORLD
The Newspaper of IS

Source: IDG Research Services, Fall 1991

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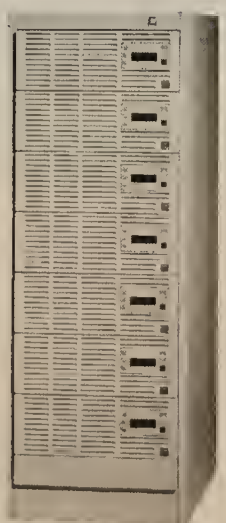
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# Texaco finds challenges

CONTINUED FROM PAGE 59

with it," while others "struggle with it and see it only as electronic mail."

To better understand these differences, the company is continuing its research on group dynamics and the human element of workgroup computing. In conjunction with the University of Minnesota, Texaco recently received a grant from the National Science Foundation to further research group-related issues.

"This is about trying to learn," Jackson said. "What are teams' needs? How do they interact? What do teams do? They are very complex organisms."

### Electronic staff meeting

While research continues, Texaco is gaining productivity boosts as well. The company recently conducted a "virtual town meeting" in which 800 Texaco employees in various locations were able to assemble electronically and "discuss" corporate issues.

Jackson would not reveal the groupware product used for the meeting because it is not yet commercially available, but he said it was a mainframe-based system that allowed Texaco "to do something we could not do otherwise."

While Jackson also did not give a dollar figure, he said the company realized significant savings from the meeting. "We didn't have [to buy] all those plane tickets" to bring the employees to one location. "Plus, they would have had to leave work for a day or so" to attend, he said.

The virtual town meeting helps illustrate Texaco's overall approach to groupware technology.

"Our strategy is to explore it and apply it as it makes sense," Jackson said.

### Technology dealer

The company lends technology to fairly straightforward processes and is not interested in the cutting edge. Also, it tends to work closely with software providers, often before products are commercially released, with the goal of swapping research as the product develops.

For example, while it is only within the last year that Lotus began winning recognition as the premier workgroup software provider with its Notes platform, Texaco began working with Lotus in 1986.

"For us it was [initially] research," Jackson said. Texaco asked, "How can we think of things differently? What input can we give to Lotus?"

Texaco also worked with the University of Minnesota long before the two received a research grant; it now uses the university's SAMM, a software tool that is not sold commercially. The product helps Texaco automate meetings and allows participants to electronically input ideas, as well as rank issues by priority.

The key now is to help blend these systems. Jackson said one recent step was to transfer files from a SAMM meeting to a Notes database.

"There's a need to document meeting action items," Jackson said. "Meetings are not a single event. You want to develop a group memory."

Once the files are transferred to Notes, users can use them for reference or discussion purposes before the next meeting takes place.

IN BRIEF

## Data General ships AV Object Office 2.0

■ **Data General Corp.** is shipping AV Object Office 2.0, an office automation product for its Unix-based Aviion line. Priced between $3,495 and $65,495, the software lets Microsoft Corp. Windows applications run with Unix servers on a Novell, Inc. NetWare network.

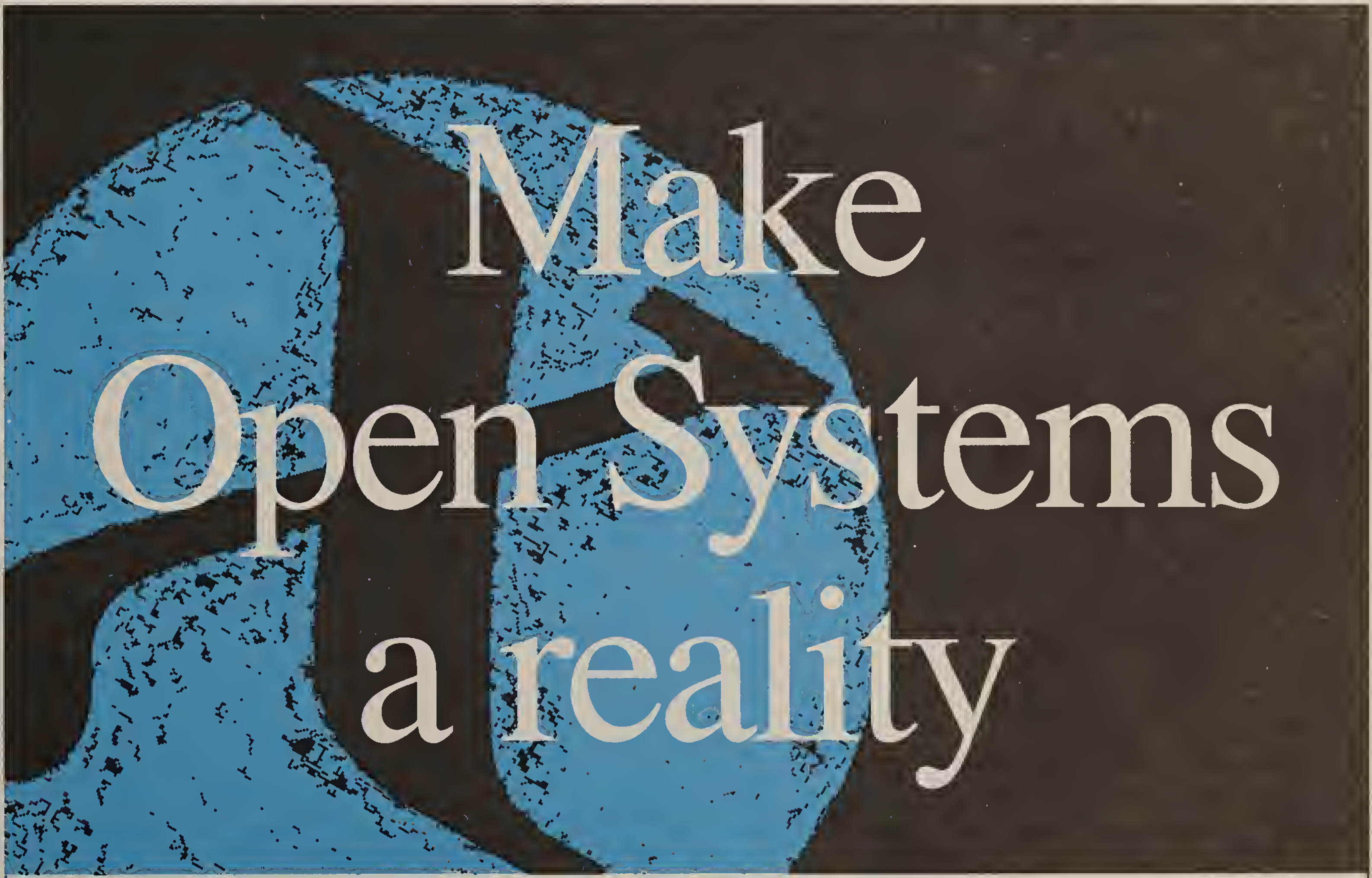
It provides integrated fax functions and enhanced support for X.400 Message Handling System and Simple Mail Transfer Protocol electronic mail and other features.

■ Document imaging vendor **Alacrity Systems, Inc.** this month will add optical character recognition from **Calera Recognition Systems** in Sunnyvale, Calif., to its stand-alone and networked products.

■ **NCR Corp.** and **Independence Technologies, Inc.** have ported NCR's Top End Unix transaction monitor to the Hewlett-Packard Co. HP 9000 system.

The two companies also plan ports to Sun Microsystems, Inc. SPARCservers, IBM RISC System/6000s and Pyramid Technology Corp. MIServer platforms in early 1993.

■ The **Open Software Foundation** has chosen **Systems Center, Inc.** to provide the Distributed Print Services part of the OSF's Distributed Management Environment.



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For further information on XTRA 92 please complete this form and return to XTRA 92 Registrations Department, X/Open Company Ltd, 3141 Fairview Park Drive, Falls Church, VA 22042-4501, USA.
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# Sun search/retrieval package helps locate business data

BY MARYFRAN JOHNSON
CW STAFF

Making an information mountain into a manageable molehill is the basic goal of SearchIt, a full-text search and retrieval application recently introduced by SunSoft, Inc. for the Solaris 1.0 software environment.

The Sun Microsystems, Inc. subsidiary likens this $295 shrink-wrapped Unix application to having one's own personal reference librarian — someone to swiftly locate on-line business data such as reports, proposals and correspondence stored on the corporate network.

The desire for database searching help is spurring more companies to dabble in this market, which is still an elusive one to judge in dollar size, said Ronni Marshak, editor of the Patricia Seybold Group's "Office Computing Report."

"This kind of technology is becoming much more visible," Marshak said. "There is a trend, with the problems of workgroups working together, of needing to not just find your own stuff but other stuff people have created."

The base technology in SearchIt hails from Fulcrum Technologies, Inc. in Ottawa, Ontario. Fulcrum's Ful/Text search and retrieval software engine gives SearchIt an intuitive searching or indexing capability that allows a user to pull up one document and then direct SearchIt to scan the network for other documents containing similar words or phrases.

Sun's AnswerBook on-line documentation and Help system also use Fulcrum's software engine. "SearchIt can use information stored on any NFS [Network File System] server or system on your network, so the information could be on an IBM mainframe, a Novell Netserver or a Hewlett-Packard machine," said Larry Kluger, senior product manager at SunSoft.

One U.S. government agency is using SearchIt to keep track of its own officials' testimony before Congress. Another user is Salomon Brothers, Inc. in New York, which uses the product to search its on-line information about companies and clients.

"SunSoft is the first company to implement content-based retrieval within the workstation client/server environment," said Peter Addison, vice president of marketing at Fulcrum.

In the legal industry, Marshak noted, there are three companies selling search and retrieval products for documents created in WordPerfect Corp.'s WordPerfect. Last month alone, two other document management software systems appeared — although on a somewhat grander scale than the SearchIt product.

Cimage Corp. in Ann Arbor, Mich., introduced an integrated document text-retrieval system geared to handle any document type from text to engineering drawing to computer-aided design data. Pricing for the Cimage system begins at $5,000.

Alliance Technologies, Inc. in Austin, Texas, came out with its TextMachine, a Unix full-text distributed textual database product designed for client/server environments. TextMachine is a suite of tools and utilities that enable developers to build systems for collecting, monitoring and managing very large distributed databases. Its price ranges from $50,000 to $300,000.

There is also full-text searching software available free on the internatonal Internet network. The best known example is the Wide Area Information Server (WAIS), developed by Thinking Machines Corp. in Cambridge, Mass.

A WAIS search, which can be launched from more than 200 servers on the Internet, uses the frequency of key words to score relevance of documents.

It can take one of the chosen documents and use it to hunt down text with similar concepts but different key words. Therefore, users can find the documents they are searching for without having to know the key words.

"Document management is basically technology everyone should have," Marshak said. "The $295 [for SunSoft's SearchIt] does sound like a reasonable price, but it's not a stand-alone application."

SearchIt, which is available now at $295 per user, is built to interoperate with Solaris DeskSet productivity tools. It runs under Solaris 1.0 and requires OpenWindows 3.0. A Solaris 2.0 version will be available early next year.

# NCR software brings RAID to StarServer

BY MICHAEL FITZGERALD
CW STAFF

WICHITA, Kan. — NCR Corp. recently released software that allows users to configure their hard disks like redundant arrays of inexpensive disks (RAID), without the need for RAID hardware.

While the Disk Array Plus, as the product is known, will work only on NCR's StarServer E line of multiprocessing servers right now, NCR is in the process of porting it to the System 3000 line and will look closely at the possibilities of porting it to other hardware platforms, as well as operating systems besides Unix.

One analyst said the concept is solid. "It's one of the necessary pieces for commercial applications which are not compute-intensive," said Michael Casey, director of storage industry research at Computer Intelligence/Infocorp in Santa Clara, Calif. "It's appropriate to do disk array management by running software on the main CPU, and I think you'll see a number of people doing disk array implementations as software."

Casey said there are other software RAID products on the market, but these are aimed more at personal computer servers than the more powerful midrange Unix market.

Disk Array Plus will give users who have servers with at least three hard drives the ability to do disk-mirroring, hot swapping, hot sparing and RAID levels 0, 1, 4 and 5 on their current systems. They will not need to reconfigure current systems to run the software.

Disk Array Plus also gives users the ability to move to an array without having to first run backup and raster procedures.

Ed Coleman, product manager for Disk Array Plus at NCR, said NCR parent company AT&T was developing the software array for the StarServer E when it took over NCR.

The product costs $3,495.

# Client/server on track

CONTINUED FROM PAGE 59

batch job on the mainframe to preprocess and extract train-movement data and download it to the RS/6000. He said a process is now being developed to enable users on the LAN to seamlessly access via a Transmission Control Protocol/Internet Protocol link the huge mainframe files of historical data, which grow at the rate of 1.7G bytes per month.

Shefelbine said the new models may be too demanding for a single RS/6000, but he said he hopes to avoid a return to the mainframe by linking multiple RS/6000s. He said IBM researchers are helping devise ways that a single program can be distributed across multiple machines for parallel processing.

The move out of the glass house has gone smoothly so far, but Shefelbine said it is not without risks as mission-critical applications migrate to an environment without all the backup and recovery capabilities of mainframe systems. "It's probably one of the weaknesses we have. But we have a small group, so the opportunity for failure hasn't really been there yet," he said.

Shefelbine said the small size of the RS/6000 earns it no respect, and users mistakenly believe they can be their own system administrators.

## NEW PRODUCTS

### Workgroup application software

Legato Systems, Inc. has announced new client/server software packages for Legato Networker, backup and recovery software for Novell, Inc.'s NetWare and Unix networks.

According to the company, the ClientPak works in conjunction with the Networker server software running on a NetWare 3.11 local-area network, IBM RISC System/6000 or Sun Microsystems, Inc. SPARCstation. Data is transferred from the client to the server via a Transmission Control Protocol/Internet Protocol network.

The product is priced at $1,500.

**Legato Systems**
**260 Sheridan Ave.**
**Palo Alto, Calif. 94306**
**(415) 329-7880**

AimTech Corp. has announced IconAuthor, an interactive multimedia authoring tool.

IconAuthor runs under the OSF/Motif X Window System interface and now offers support for Hewlett-Packard Co.'s 9000 Series 700 workstations. The visual programming environment for the product is icon-based, enabling users to develop interactive multimedia applications that join graphics, text and animation, audio and full-motion video.

IconAuthor costs $7,500 for one user, $15,000 for four users, $25,000 for 10 users and $75,000 for unlimited use at one site.

**AimTech**
**20 Trafalgar Square**
**Nashua, N.H. 03063**
**(603) 883-0220**

Island Graphics Corp. has introduced IslandPresents, a multimedia presentation and business graphics package.

The product was designed for Unix and is available for Sun Microsystems, Inc. SPARCstations and compatibles using SunSoft, Inc.'s Solaris software environment. Users can create full-color presentations and illustrate the presentations with clip art from IslandPresents' library of over 1,100 images, the company reported.

The tool has multimedia features to display full-screen presentations on SPARCstations and includes three views of a presentation: an Outliner, a Slide Editor and a Slide Organizer.

A single-user network license for IslandPresents costs $995.

**Island Graphics**
**4000 Civic Center Drive**
**San Rafael, Calif. 94903**
**(415) 491-1000**

### Diagnostic equipment

Mercury Interactive Corp. has announced automating testing support of X Window System-based software applications for Hewlett-Packard Co.'s 9000/700 series Unix workstations.

XRunner is a software testing tool that automates quality assurance procedures. Through a grahical user interface, the product mimics the way a user would manually test software, according to the company.

Keystrokes and mouse movements are put into an application, and output is monitored for results. Prices start at $50,000.

**Mercury Interactive**
**3333 Octavius Drive**
**Santa Clara, Calif. 95054**
**(408) 987-0100**

### Micro-to-micro

AnswerSet Corp. has released Clientele Standard Edition, a support automation system.

Clientele Standard Edition maintains and tracks customer information, product data, call records and service agreements. Users can customize the product's screen and field names to fit specific needs, and common customer data can be shared with other departments, the company reported.

Prices start at $795.

**AnswerSet**
**21771 Stevens Creek Blvd.**
**Cupertino, Calif. 95014**
**(408) 996-8683**

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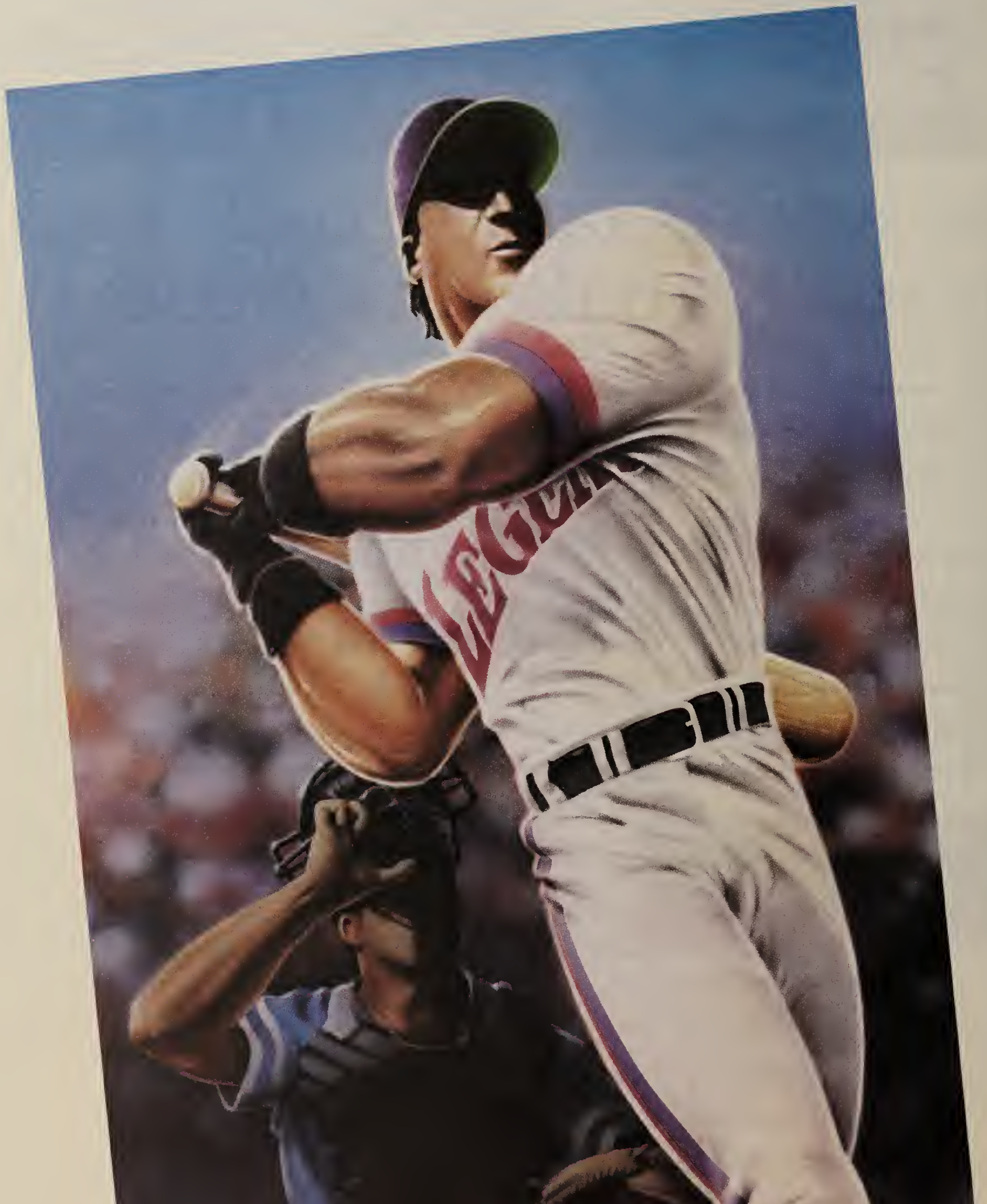
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We've always offered outstanding technologies. Now, our combined product lines deliver an unparalleled range of solutions. And together, we're forging an exciting new strategy to allow organizations to expand systems management across the entire enterprise.

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But our new strength is more than just size. The dedication, quality, and commitment to excellence that characterized the people of both Goal and Legent are what attracted us to each other in the first place. So even though we're a new team, we're taking to the field with the same game plan both of us have always played by.

If you're an IS professional, we think you'll be interested in knowing more about Legent.

Call us at **1-800-676-LGNT ext. 81.** We'll send you a copy of *The New Leader in Systems Management.* It explains why Legent joined with Goal, and what you can expect from the new team; a team dedicated to providing leading edge solutions for systems management.

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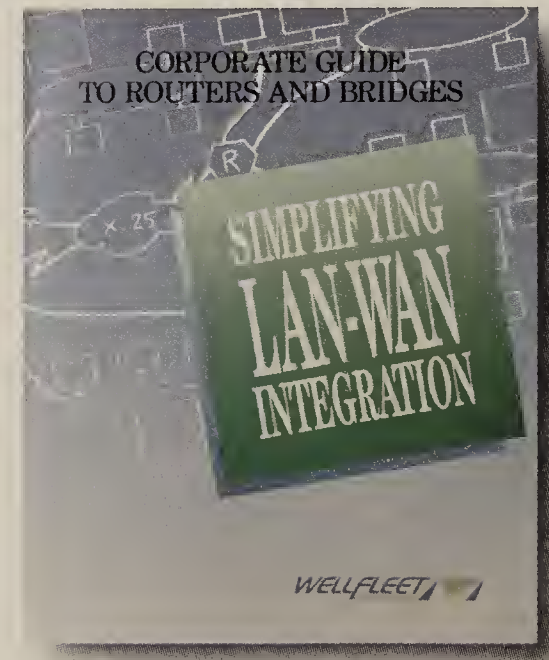

After all, internetworking is a challenging subject – especially if it's not your primary focus. Fortunately, Wellfleet has produced a comprehensive guide that removes the mystery from internetworking. The guide is perfect for anyone who wants to gain a more thorough understanding of routers and bridges, communications protocols, internetwork design and cost-justification, and selection criteria. Call **1-800-448-3400, Ext. 499W** for a free copy, or to send a complimentary copy to a colleague. Whether you're an internetworking expert or novice, it's sure to come in handy.

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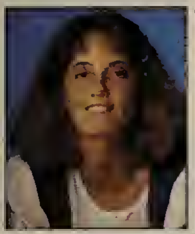
COMMENTARY

*Joanie M. Wexler*

# The FCC makes history



The Federal Communications Commission recently left about a size 14D footprint in the sands of time en route to the creation of one humongous, thriving network with tentacles stretching from sea to shining sea.

Its mid-July decision to grant the local telephone companies permission to play in the dial-up video service biz could revolutionize life as we know it. Dial-up movies, educational seminars and simulated real-estate tours could be merely tame precursors to Star Trekkian Holodeck parties or Jane Jetson-style push-button dinners.

With its ruling, the FCC has put a feather in the cap of Mitch Kaporian efforts to leverage existing network infrastructures for consistent nationwide services. This must have been a tough decision for an agency historically saddled with the task of balancing the merits of entrepreneurship with appropriate monopoly control. However, the sprawling network that was built up by AT&T and its regionals in the 100 years before

*Continued on page 72*

# StrataCom adds IPX flexibility

*Management feature gives T1 switch dynamic allocation capability*

BY ELISABETH HORWITT
CW STAFF

SAN JOSE, Calif. — A congestion management capability recently introduced by StrataCom, Inc. will give its T1 IPX Fast-Packet frame-relay switches the ability to allocate extra bandwidth to users as needed and better fulfill user expectations about frame relay's touted "bursting" capability.

The IPX switch traditionally divides up a 1.5M bit/sec. T1 trunk into individual user circuits and concentrates on ensuring that users get the most out of those circuits, said Bryan Long, a StrataCom product manager.

Until now, the IPX could not allocate extra bandwidth to any user beyond the user's committed information rate — or contracted bandwidth "ceiling" — even when unused bandwidth existed on the T1 trunk, Long said.

This was because of the danger that too many temporarily expanded user circuits would feed into the same switch and cause congestion that would impair other users' network performance.

This limitation has been a concern of some companies, such as Industrial Design Corp., that have tested StrataCom-based services and have been disappointed enough with the lack of bursting capability to discontinue the service [CW, April 6].

Competing platforms do provide users with temporarily expanded bandwidth allocations, or bursts, because the vendors simply disregard the danger of switch congestion, Long said.

> UNTIL NOW, THE IPX could not allocate extra bandwidth to any user beyond the user's committed information rate.

### Frame-relay delays

When congestion does occur, the switches respond by dropping frames and then retransmitting them, which causes delays, he added. This is a danger with the frame-relay services offered by carriers such as Sprint Corp., which do not use StrataCom switches, according to observers.

StrataCom's ForeSight, announced last month, enables IPX nodes to communicate with one another about how much excess bandwidth exists throughout the network and to lift the bandwidth ceiling of a given circuit depending on what bandwidth is available, explained Steven A. Taylor, president of Distributed Networking Associates, a consultancy in Greensboro, N.C.

Meanwhile, ForeSight monitors all circuits for incipient congestion problems, StrataCom said.

StrataCom's announcement will provide end users with the dynamic bandwidth allocation services that "were frame relay's original intent," said Ginny Mellinger, a senior analyst at International Data Corp. in Framingham, Mass.

For example, Long said, a user could request enough extra bandwidth to distribute a catalog to customers overnight. The user would pay only for the time during which the bandwidth was needed and would save money because the transmission took place during off-peak hours, he added.

AT&T, WilTel, CompuServe, Inc. and Canadian carrier National Telecom Corp. are among the carriers that offer IPX-based frame-relay services. Telecom New Zealand recently began offering IPX-based services in the Pacific.

Foresight is scheduled to ship in the first quarter of next year, priced at $1,000 per frame-relay processor. Each processor supports four ports, StrataCom said.

*Senior editor Joanie M. Wexler contributed to this report.*

# NET readies frame-relay interfaces

BY JOANIE M. WEXLER
CW STAFF

REDWOOD CITY, Calif. — Network Equipment Technologies, Inc.'s (NET) recent addition of frame-relay capabilities to its wide-area network equipment served more to placate forward-looking users than to scratch any immediate user itches, NET customers said.

NET plans to have frame-relay interfaces available for its high-end T1 multiplexer and statistical multiplexer wide-area transmission equipment come October. However, the user community is still largely in the studying stages of frame relay, a technology that has been highly publicized but sparingly deployed as users preoccupy themselves with getting their router internetworks in place and evaluating other emerging high-speed WAN technologies.

"We're going to want to take advantage of [NET's frame-relay capabilities] in a year or two," said Mark Lillie, manager of client computing services at Community Health Care Plan, an NET customer in New Haven, Conn. Lillie said he anticipates that an electronic medical records application that is under evaluation will force the high-performance connections afforded by frame relay.

Larry Calabro, a network engineer at Kirkland and Ellis, a Chicago-based law firm, said the NET announcement "adds flexibility to the decisions we can make for tying outside connections to our backbone." He said his interest in NET's frame-relay interface would be for linking temporary offices, such as client sites that have high bandwidth requirements, to his private NET backbone via public frame-relay services.

However, the firm would not be implementing frame relay "for a year or so," he said.

Like frame-relay pioneer StrataCom, Inc.'s recent switch upgrade (see story above left), NET's architecture addresses user concerns about sustaining prolonged data bursts. A frame-relay card, dubbed the Frame Relay Exchange, creates a virtual packet network that can be overlaid onto a high-end T1 or statistical multiplexer network. The subnetwork can expand and contract to use all network resources, analysts said.

# EDI: The information-intensive way to move cargo

BY HAL GLATZER
SPECIAL TO CW

Cargo in transit is information in motion. With electronic data interchange (EDI), freight forwarders such as The Harper Group in San Francisco have become "information-intensive," according to Steven J. Olson, Harper's vice president of information services and chief information officer.

"Logistics is a major component of a delivered product's price," he said. "By the year 2000, more money will be spent on logistics information systems than on inventory carrying costs."

The Harper Group is a holding company that owns 12 specialized transportation businesses that employ more than 3,500 people in more than 300 branches in 43 countries. They can now track the two-way movement of orders and inventories electronically and monitor the status of shipments.

Stephanie Faucher

"It was not difficult to sell top management on the idea of electronic mail and EDI," Olson said. "It was clear that we would make better use of networks we had already built for ourselves. Telex is very expensive. Electronic mail is cheaper. That's a straight-off cost justification. It's easy to point to sending paper and rekeying data as places to cut costs."

EDI also enabled Harper to make changes in its human resources, refocusing staff to take on new types of jobs. "The company has doubled in revenue over the last three years, but our people now are spending more time servicing customers and less on internal management," Olson said.

For example, the company has cut its accounting staff: Two people in San Francisco can now do what 15 used to do in a remote office. "That's saving $400,000 a year, but it represents an initial investment of just $40,000 in systems development and $100,000 in capital equipment — equipment that's depreciated over five years. That's a 10-to-1 return," Olson said.

However, he warned, "EDI is not — by itself — a solution." It has to be integrated with the other application programs in the partners' computers: finance, manufacturing, purchasing, inventory and so on. "It's in that integration where the bene-

*Continued on page 73*

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# in corporate America.
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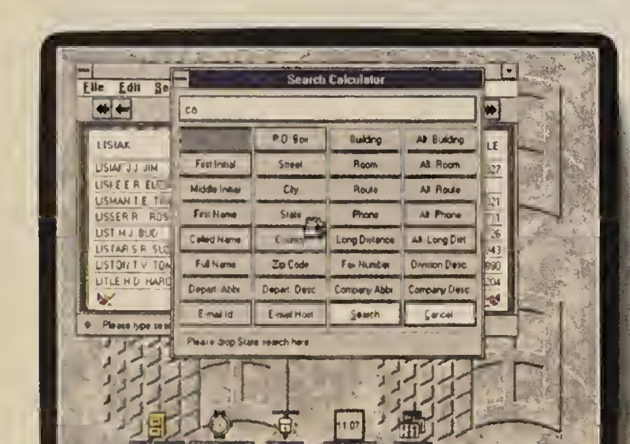
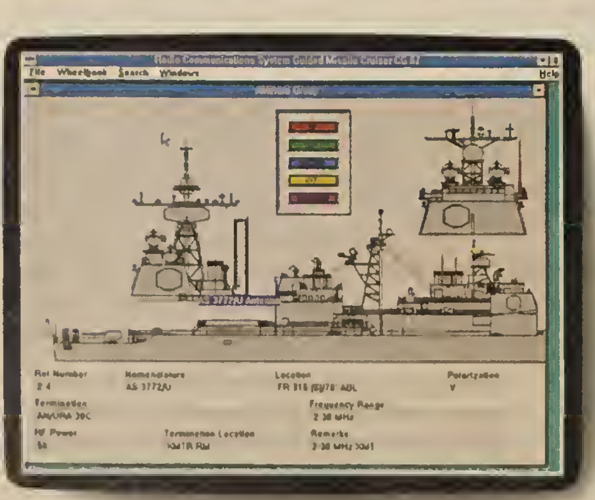


## CHEVRON

Chevron's LAN system clients asked for a PC-based corporate directory to give PC users a "phonebook" similar to the one on their mainframe. The problem was there was no solution on the market that could accommodate 45,000 records with 30 fields each. To solve their problem, they used Visual Basic,™ MicroHelp Muscle for Visual Basic, VBTools, EditTool, ButtonTool, and Raima Data Manager to create CLSctn for Windows. Now the users have an easy-to-use directory that allows them to access information by several different indexes.



## U.S. NAVY

Navy ships were drowning in paper. The Chief of Naval Operations has estimated that it was costing $400 million per year to store, access, control and update the vast amounts of required technical information. Using Microsoft C, the Windows SDK, Microsoft Word for Windows and Excel, and Raima Data Manager, they developed the Interactive Electronic Technical Manual. It allows them to store all of the volumes of technical information on a CD-ROM, which can be accessed with the click of a mouse.

*© 1992 Microsoft Corporation. All rights reserved. The Windows World Open competition was sponsored by ComputerWorld, Windows Watcher, Windows World and Microsoft. Winners were selected by five independent Windows experts. Choice of development tool was not a criterion for entrance in the contest. Corporation. Micrografx is a registered trademark of Micrografx, Inc. Bridge Tool·Kit is a trademark of Softbridge Microsystems Corporation. Q+E is a trademark of Pioneer Software Systems Incorporated. Superbase is a registered trademark of Precision Incorporated.*

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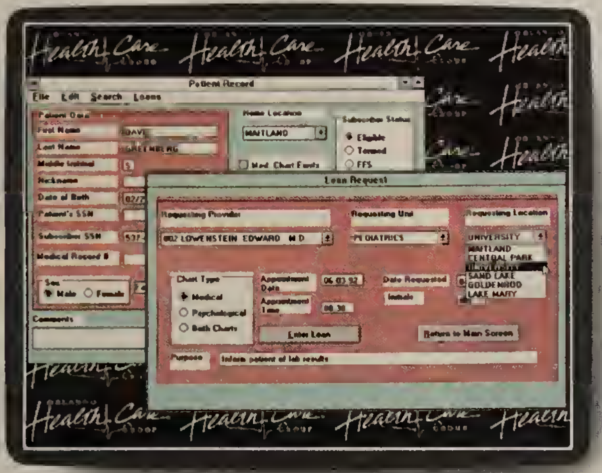
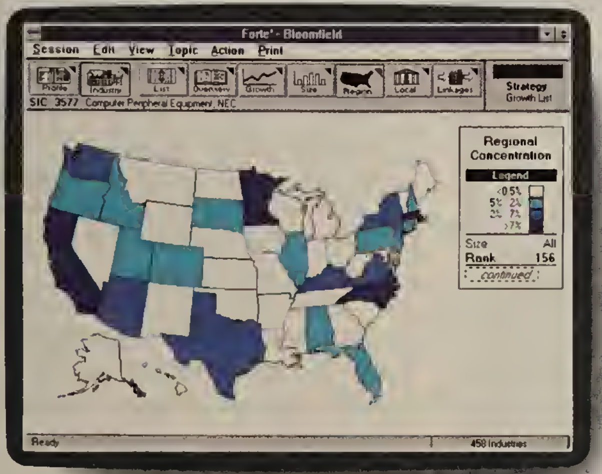


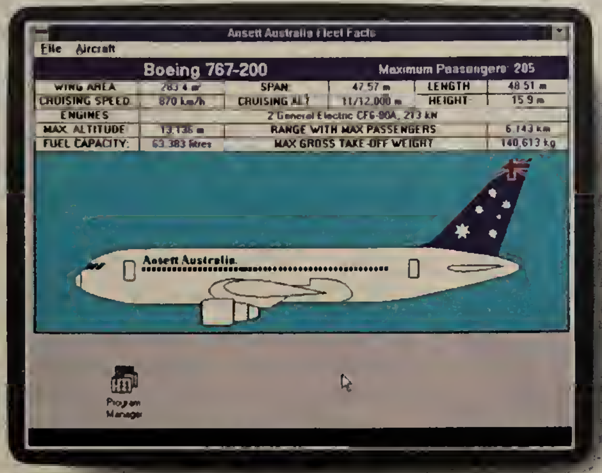
## ORLANDO HEALTH CARE GROUP

Orlando Health Care is a 52-physician practice providing HMO services at 6 medical facilities. They had a problem tracking and updating over 100,000 medical charts, because patients can receive services at any of the facilities. So they used Microsoft Visual Basic, Q+E™ Database Library, Microsoft SQL Server, Microsoft LAN Manager, and Select Comm Server to create the Master Patient Index, a systemwide database. The new system saves time and helps the company provide better quality health care.



## PHH FANTUS

As an economic development consulting company, PHH Fantus analyzes enormous amounts of data. Some of their studies require the analysis of over 450 industries, and with the old manual system, it could take over 200 man-hours. To make their operation more efficient, they used Microsoft C, the Windows SDK and Raima Data Manager (formerly db VISTAIII) to design "Forté," a giant repository for data on a network server which is continually maintained and updated. Analysis that once took weeks now takes just hours.

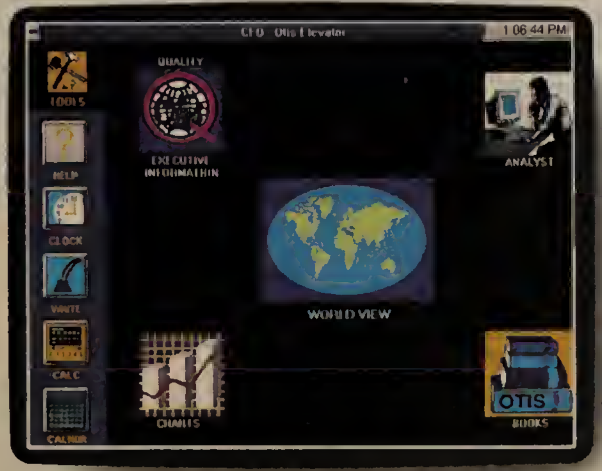

Ansett Australia Fleet Facts

Boeing 767-200 Maximum Passengers: 205

| | | | | | |
|---|---|---|---|---|---|
| WING AREA | 283.4 m² | SPAN | 47.57 m | LENGTH | 48.51 m |
| CRUISING SPEED | 870 km/h | CRUISING ALT | 11/12,000 m | HEIGHT | 15.9 m |
| ENGINES | 2 General Electric CF6-80A, 213 kN | | | | |
| MAX. ALTITUDE | 13,136 m | RANGE WITH MAX PASSENGERS | | | 6,143 km |
| FUEL CAPACITY: | 63,383 litres | MAX GROSS TAKE-OFF WEIGHT | | | 140,613 kg |

## ANSETT AUSTRALIA

As an airline, Ansett Australia needed to provide a better information system for its users. The old system forced users to wade through a large printed book for flight information. To solve this problem, they created the Ansett Travel Planner, with Microsoft Visual Basic, Windows SDK, Microsoft BASIC Professional Development System. Now it's much easier to update and access flight information. And there's a database that can store travel preferences for customers.



## OTIS ELEVATOR

Senior Management needed a more accurate and timely way to consolidate all the financial information that was coming in from Otis companies around the world. So they used Microsoft C and Microsoft Excel along with Bridge Tool-Kit™ and Keyworks to create CFO, an executive information system. Now the analysts and executives can quickly access important data that'll allow them to spot and react to business trends.

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# Wexler

CONTINUED FROM PAGE 69

divestiture has of late been a bit underleveraged on principle.

The FCC seems to be realizing now that barring the RBOCs from participating in information services that society demands *because* of their size and reach is like carving a new cross-country trail with a machete when you could just hop on Interstate Route 80. Bypass carriers have long reiterated the valid point that overbuilding the telecommunications infrastructure with redundant networks is a waste of time, effort and customers' money.

We need to use what is here as a building block for getting as many services to as many places as possible, and the FCC's July decision was pivotal. The state public utility commissions have been long validating this attitude through their decisions to allow alternative access providers to hook into regional networks and proliferate access.

Admittedly, the FCC has it tough, having to continually review how much regulatory rope to feed the monopoly-status utilities. But signs are emerging that enough years have passed to begin snapping the local phone companies out of their sluggish stereotypes and into competitive mode.

For instance, Bell Atlantic is in the throes of a $2 million infrastructure revamp project specifically aimed at ensuring the RBOCs' survival among telecommunications competitors. Joseph T. Ambrozy, CIO, recently acknowledged that breaking down regulatory barriers to the RBOCs in the cable television business would be integral to the survival of all RBOCs.

The interesting question is what tactics the RBOCs and cable TV companies will use to duke it out. Will the phone and cable TV companies grudgingly link arms, much as the alternative access carriers and RBOCs have done, and somehow hook their networks together? Or will they go head to head, fostering the "network island" problem?

The phone companies are more far-reaching but will likely continue to be confined by regulatory straitjackets, according to Robert Rosenberg, president of Insight Research Corp. in Livingston, N.J.

The FCC decision to allow the local phone companies to offer as well as distribute information services reminds me a little of my liberating seventh grade school year. That was when the school board finally decreed that girls could wear pants to school. But the firm rule was that no jeans were allowed; we could only wear "nice slacks."

A month later, we were clad in Levi's, work shirts and desert boots. Makes you kind of relish what's around the corner for the phone companies.

Wexler is a *Computerworld* senior editor, networking.

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IN BRIEF

## Cabletron/SAS unveil gateway

■ **Cabletron Systems, Inc.** and **SAS Institute, Inc.** have jointly developed a gateway that enables Cabletron Systems' Spectrum to send information to applications based on SAS database and analysis software, according to the companies.

The gateway will enable users to integrate Spectrum information with third-party applications that perform device utilization analysis, network inventory management, trend analysis and capacity planning, Cabletron said. The gateway is priced at $1,000.

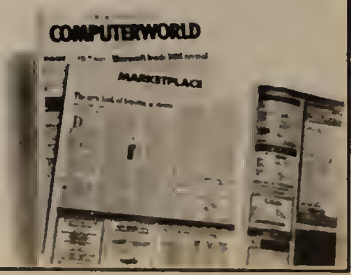
Cabletron said it plans to introduce a data server that will enable Spectrum to port information to a wide range of database and analysis systems.

■ **OSInet** has now successfully tested 62 Open Systems Interconnect (OSI) products from 17 vendors for interoperability, the McClean, Va., company announced.

Vendors included AT&T, Amdahl Corp., Bull HN Information Systems, Inc., Control Data Corp., Hewlett-Packard Co., Novell, Inc., Digital Equipment Corp. and Unisys Corp. The products were based on either the OSI Message Handling System or File Transfer, Access and Management protocol.

OSInet is an independent test bed facility for testing multivendor OSI interoperability.

Check out the Marketplace Pages on Page 108.



# Remote database access assists crime fighters

BY THOMAS HOFFMAN
CW STAFF

NEW YORK — Two telecommunications providers have formed an alliance to deliver wireless data communication capabilities to public safety organizations.

The alliance between Ram Mobile Data and RF Data will combine RF Data's computerized state and national crime database access system, RF/Switch, with Ram's national wireless data communications service, which is based on Mobitex network technology supplied by Ericsson GE.

Company officials said the combined technologies will enable public safety officers to access federal, state and local law enforcement databases directly from their vehicles, using portable computers and radio modems, thereby bypassing dispatchers and avoiding information bottlenecks.

**Suspect profiles**

Once they have accessed the appropriate database, law officers will be able to receive information on suspects within seconds, according to the vendors.

RF Data officials said they expect the service to be cost-effective for smaller communities if they share the service. By dedicating a single RF/Switch gateway to a number of municipalities, communities that band their fiscal resources can rely on a single gateway and reduce their monthly costs.

A spokesman for RF Data, based in Hinsdale, Ill., said the alliance expects to ship a combined product by year's end. He added that the firms have not yet decided on a pricing model.

# Faster modems on the way

*Vendors promise product fidelity, upgradability to new standard*

BY CAROL HILDEBRAND
CW STAFF

Modem vendors are jumping the standards gun by announcing products they say will conform or upgrade to the so-called V.Fast standard, which is more than a year away from fruition.

The standard, which is currently under development by standards developer Consultative Committee for International Telephony and Telegraphy (CCITT), will cover 28.8K bit/sec. dial-up communications, the fastest speeds yet for modems.

However, CCITT representatives have said that the earliest the committee would approve a standard is September 1993, but the first quarter of 1994 is a much stronger possibility.

Until the standard has been approved, any "V.Fast modem" that is announced is really a proprietary two-wire duplex unit that runs at speeds faster than the current high-speed standard, V.32 bis standard.

That has not stopped vendors from announcing such products. Racal-Datacom, Inc. announced a series of small-footprint modems, including units that the company said will be compatible to the new standard. US Robotics, Inc. also joined in, unveiling an upgrade path from its current Courier V.32 bis.

THE COMMITTEE MAY approve a standard by September 1993, but the first quarter of 1994 is more likely.

Users can upgrade for $299 as soon as the standard is settled, the company said.

The new standard allows vendors to fatten up their margins in a very lean market, according to Judy Parani, an analyst at BIS Strategic Decisions in Norwell, Mass. "Data modems are a real commodity item," she said. "When you have something new with a faster speed, you can charge a little more and keep the margins up a little longer."

However, even when the standard is approved, a lot of data will not achieve top speeds. Dale Walsh, vice president of advanced development at U.S. Robotics, said the public switch telephone network will be the bottleneck.

Walsh estimated that by the time the standard is approved, true 28.8K bit/sec. speeds will be achievable on only about 20% of the phone lines, with the majority supporting 19.2K bit/sec. transmissions.

## NEW PRODUCTS

### Network management

Bolt Beranek and Newman, Inc. has released its Network Management System (NMS).

The product is an open, standards-based network management system that uses an architecture based on Digital Equipment Corp.'s Enterprise Management Architecture. Users can monitor and control the company's routers, packet switches and access devices, according to the company.

NMS was designed to improve network performance by supporting network analysis, configuration, monitor and control and troubleshooting.

Prices start at $25,000.

**Bolt Beranek and Newman**
**70 Fawcett St.**
**Cambridge, Mass. 02138**
**(617) 873-4000**

### Local-area networking software

FortuNet, Inc. has introduced Nsure 1.1 Archive Library.

The product is a DOS-based backup-and-restore application. Support for a variety of digital audio tape and 8mm helical scan jukeboxes is provided. Nsure 1.1 Archive Library includes a menu user interface and a script language.

Nsure 1.1 Archive Library costs $1,895.

**FortuNet**
**Suite 435**
**2180 South 1300 East**
**Salt Lake City, Utah 84106**
**(801) 467-6887**

### Gateways, bridges, routers

Digital Equipment Corp. has introduced the DEC WANcontroller 720, designed for the reduced instruction set computing-based workstation and server market.

Users can transmit high-speed, network-intensive graphics and accelerate normal wide-area network functions, such as transferring files to other users, at very high speeds on WANs.

The DEC WANcontroller costs $2,500.

**DEC**
**146 Main St.**
**Maynard, Mass. 01754**
**(508) 493-5111**

Penril DataComm Networks has introduced two Ethernet bridges: the Series 1210 Local Ethernet Bridge and the Series 1220 Remote Ethernet bridge.

The Series 1210 bridges two local Ethernet segments and supports 10Base5, 10Base2 and 10Base-T networks and handles media conversion between different networks.

One Ethernet segment and up to two remote wide-area networks can be bridged with the Series 1220. Support for various WAN capabilities are included in the Series 1220.

The Series 1210 Local Ethernet bridge costs $2,895 and the Series 1220 Remote Ethernet Bridge costs between $3,195 and $5,395.

**Penril DataComm Networks**
**1300 Quince Orchard Blvd.**
**Gaithersburg, Md. 20878**
**(301) 921-8600**

# Information-rich EDI moves cargo

CONTINUED FROM PAGE 69

fits of EDI are found. A company shouldn't start by thinking about sending transactions back and forth; they should go back and think about the whole process, end to end. They often underestimate the amount of money it takes to implement EDI."

Moving products from country to country requires that forms be filled out for customs clearance and delivery of each shipment, but in many countries, EDI can actually move the information in advance of the goods — completing the paperwork before a plane lands.

Cummins Engine Co. in Columbus, Ind., is typical of The Harper Group's EDI partners. Whether it receives supplies or ships products, Cummins is "not interested in materials without information." The goal, according to Fran Warren, manager of EDI, is a "synchronous flow of materials and information."

The company used to do everything with paper, which employees had to "translate" into various formats. "But with EDI, it's pretty routine by now," Warren said. The last obstacle it overcame was the difference between "transaction sets," mainly that European messaging standards differed from those in North America, such as ANSI. Now there is agreement on a common, international messaging standard, called EDIfact.

The Harper Group handles worldwide, on-line EDI transactions with a mix of computers: an IBM mainframe at its San Francisco headquarters; 10 IBM Application System/400 midrange computers in various European and Far Eastern cities; and approximately 800 personal computers (mostly purchased from NEC Corp.) in the U.S. In addition, there are still "hundreds" of dumb terminals — IBM 3270s — on an IBM Systems Network Architecture network, although Olson noted that the company is gradually replacing them with PCs that act as workstations.

Data communications are handled by value-added networks — mostly over ground links.

With all its international traffic, The Harper Group spent more than $3 million on data communications this year, which is actually slightly less than it spent in 1988. Olson noted that he's gotten "more bang for the buck" since then.

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Glatzer has reported on the information technologies for 15 years.

## EDI speeds processes

"Behind the scenes, EDI and E-mail are integrating all of a business' information in a single system," said Tim Wilson, executive editor of DataTrends Publications, Inc. in Vienna, Va., which publishes the biweekly newsletter "Advanced Office Technologies Report."

The transportation industry is one of the largest users of what Wilson calls "electronic commerce" because it operates in many places at once and must deal with many companies that may use different technologies and computing systems. By agreeing on standards for messaging, those differences are minimized. "From our perspective," Wilson said, "EDI and E-mail lend themselves to that type of environment."

Wilson also sees increasing interest in "the development of information as an asset: using EDI and E-mail not just to move products around but to improve the overall business process." He said the traditional way of handling day-to-day business through paperwork and separate departmental computers requires "rekeying and retooling to make the information fit."

EDI is not only faster ("no more two-day waits at each step"). With it, information is part of a single set of computer systems and a single electronic process that takes it from supply through manufacturing, from warehouse through shipping, from invoicing through electronic funds transfer. In short, Wilson said, "Rather than technology adapting to the business process, the business process is adapting to the technology."

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Of course, you don't have to be a contact lens maker to see things so clearly. All kinds of companies are looking to advanced AS/400 applications. Companies like Porsche Cars North America Inc. are also using CallPath/400 to improve customer service. And companies like Purity Wholesale Grocers, Inc. and Omak Wood Products are using our advanced applications to fax invoices and information directly from their AS/400s, so they can serve their customers better and reduce costs.

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# LARGE SYSTEMS

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# AP braces for campaign finale

*News service faces election coverage pressures with VAXs and Sun 470s*

MELINDA-CAR0L BALLOU
CW STAFF

While Governor Bill Clinton and President George Bush spar with one another, the Associated Press news service is beefing up its computer systems to handle data flow and news coverage more effectively.

For instance, the AP's information systems department recently completed the process of bringing its U.S. bureaus to Digital Equipment Corp. VAXclusters from aged DEC PDP-8s.

Even though other businesses have been focusing on distributed processing and have been spreading out resources to remote sites, the AP replaced distributed PDP-8s with centrally located VAXclusters and distributed access.

"The AP wire service has constant deadlines, and we also have a broadcast service for nonprint media which every hour is trying to get stuff out, so we must have high availability," said Robert Friedman, manager of news systems development at the AP.

The AP chose to replace the 25-year-old PDP technology in hopes of gaining more reliable and quicker access to material.

**ON SITE**

**The Associated Press**
*New York*

- **Challenge:** To provide greater reliability in news service systems; prepare vote-capture system before presidential election.
- **Strategy:** Replace obsolete PDP-8 news bureau system with VAXclusters; upgrade Motorola system to Sun 470s, 670s and SuperSPARC platforms for vote-capture systems.
- **Expectations:** Increased availability, cost-efficiency and new applications made possible; ability to handle high volumes of votes coming in for elections.

"Our new architecture goes against the trend which is currently toward distributed computing. With the PDPs, we had 40 computers based in 40 different locations," Friedman said. "We've moved to a large, extended LAN-based network with a lot of bridging and a small number of data centers."

A typical AP bureau now has about 16 personal computers hooked up to two terminal servers on an Ethernet network, and the servers are attached to Vita-Link bridges that communicate via dedicated lines or dial-up backup to VAXclusters in New York or Kansas City. Before, the AP relied on 40 PDPs; now, each of the two VAXclusters include three nodes of VAX 6000-class machines.

"In the old days, it was possible for a system to go down for a couple of hours or even days because we

*Continued on page 78*

# Bank of America tests downsizing

*Moves host apps to PC LANs across 11 states*

BY JEAN BOZMAN
CW STAFF

SAN FRANCISCO — The Bank of America is banking on two things to stay ahead of processing requirements of the 1990s: dozens of mainframes in its three data centers and a downsizing program that has moved many host applications to personal computer local-area networks in bank offices throughout 11 states.

Large-scale IBM and Tandem Computers, Inc. machines collectively use 2,000 million instructions per second to handle 10% of the nation's checks, bank officials said. But downsizing host applications has been taking place here for six years in a bank-wide program designed to move data and software closer to the user.

The road to downsizing was somewhat bumpy at first, said Mark Bowler, systems director at the bank's Advanced Technology Group in Concord, Calif. In 1986, as PCs were shipped out to hundreds of bank branches, a six-month "hold" was placed on the project to deal with logistical problems.

Some of the problems were physical. "The power consumption of that many PCs caused a brownout at one of our locations," Bowler told attendees of a Downsizing Expo seminar held here late last month. "If the voltage in the building went down, the PCs would go into a state and then hang." That problem was solved with the purchase of a $500,000 power supply.

## Downtime utilized

The bank used the delay to find new ways to support thousands of PC LAN users and distribute software to hundreds of remote sites electronically.

The bank wrote special IBM NetView alerts to signal PC failures, such as hard disk failures, prompting field support personnel to repair the problem. Software had to be distributed electronically because of the bank's size, which made disk software updates unreliable.

Today, the $7 billion bank — the nation's second largest — has 1,000 Token Ring LANs and roughly $250 million invested in PC technology in the 900 California branches it had before its 1992 merger with Security Pacific Bank.

Most PCs run Microsoft Corp.'s Windows instead of the OS/2 operating system envisioned by former Chief Informatin Officer Michael Simmons in the late 1980s. "We couldn't get OS/2 stable enough at the time," Bowler commented.

The bank will gain even more IBM-compatible PCs from Security Pacific; its Seafirst unit in Seattle has a cache of 1,000 Apple Computer, Inc. Macintoshes.

By 1995, Bowler plans to test some Unix parallel processors as potential replacements for some IBM mainframes.

Despite its use of cheap hardware, downsizing did not reduce total information systems costs for staff and support, he said: "The budget has stayed the same, but the mix of what people are doing is different."

Now, IS staff members spend more time talking to end users, training branch personnel to use the PC LAN applications and keeping software updates flowing smoothly to the remote sites.

# HDS beefs up service offerings to hold onto IS shops

BY JEAN BOZMAN
CW STAFF

SANTA CLARA, Calif. — In a move to hold onto the 3,000 information systems shops that have its IBM-compatible gear, Hitachi Data Systems Corp. is beefing up its service offerings.

The $1.4 billion firm recently told industry analysts that it will soon field new software tools to help IS managers plan for IBM's Escon fiber-optic channel system. It also plans to tap several more third-party vendors to broaden its service offerings.

But HDS, a 1989 joint venture of Hitachi Ltd. and Electronic Data Systems Corp. that sells IBM-compatible mainframes and peripherals, is moving cautiously — perhaps too cautiously, according to some analysts. It does not plan to build up its internal consulting staff any faster than business permits. For the past 18 months, a core staff of fewer than 10 consultants has managed HDS' relationships with outside consultants. Among these are database experts from Software AG of North America, Inc. and Oracle Corp., HDS said.

"We could hire 300 people, but we probably won't do that," said Supriyo Sen, an HDS marketing vice president responsible for competitive analysis. "Our objective is to make it very clear that we are not competing with service consultants." In effect, Sen said, HDS will act as the prime contractor that lines up multiple service providers for a customer account.

The HDS service program includes feasibility studies, configuration management, capacity planning, maintenance planning and change management. HDS also sells software tools that can be used by IS managers to do their own planning. The tools range in price from $25,000 to $200,000, HDS said.

Some HDS users have used the IS planning tools but have not yet signed up for consulting services. "Typically, we tend to do things in-house," said Glenn Rudyanski, a software specialist at Prudential Service Cos. in Roseland, N.J. "We have HDS as a sounding board, and if we run into a problem, they'll help us out."

The IS arm of The Prudential Insurance Company of America started using HDS' Technical Assistance Program/System Managed Software (TAP/SMS) software tool in October 1991. Now the shop, with 2T bytes of disk capacity, is about 50% converted to IBM's SMS, Rudyanski said. Prudential has one HDS mainframe — and dozens of HDS disk drives. "The TAP/SMS tool goes out and scans the entire DASD farm," he said. "It builds a database on data sets and volumes, so you can look for any exceptions." Rudyanski said the conversion of all data sets to SMS at the Roseland site is expected by the end of 1993.

> "OUR OBJECTIVE is to make it very clear that we are not competing with service consultants."
>
> SUPRIYO SEN
> HDS

Industry analysts lauded the goals of HDS' new-and-improved consulting but questioned the level of commitment. "HDS has a long way to go to compete in the consulting big leagues," said Frank Gens, vice president of technology assessment at Technology Investment Strategies Corp. in Framingham, Mass. "They are making incremental moves to grow beyond the mainframe business, but the question is what level of investment these new ventures get."

But HDS' consulting move is an outward sign of a deeper cultural change at HDS. In the 1980s, the company had been National Advanced Systems, a firm that distributed Hitachi gear. "As it becomes a major systems vendor, the focus is on growing the field sales and support organization and on providing value-added services," said Mark Hess, vice president at Gartner Group, Inc.'s large computer strategies service.

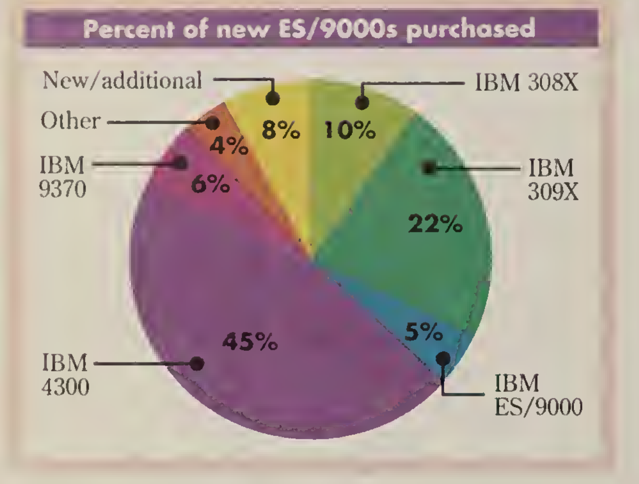
HDS is gaining 200 new sites each year, growing at 15% annually, a faster rate than its larger competitor, Amdahl Corp., according to Hess.

# Study disproves 4381 myth

IBM's midrange mainframe group, the 4381, is usually cited as among the most vulnerable to the downsizing trend. But recent research shows that this processor family is in fact most often replaced with other mainframes.

## Stepping up

*More IBM ES/9000 users are migrating from IBM 4300 machines than from any other platform*



Source: Computer Intelligence

Computer Intelligence in San Diego tracked the replacement patterns of 4381s between January 1991 and May 1992 and found that some 90% were replaced with other mainframes, usually from IBM.

About 30% of 4381 users opted for a larger 43XX box; another 8% installed an IBM 308X or 309X; and some 47% opted for an IBM Enterprise System/9000. Still, only 12% of the ES/9000s installed represented new business for IBM, the market research firm said.

Ten percent of the 4381s were replaced by multiple personal computers, high-performance workstations or minicomputers.

During 1991, the population of IBM mainframes and compatible machines dropped 11% in the U.S.

For every ES/9000 installed between January 1991 and May 1992, approximately 1.3 mainframes were displaced by outsourcing, data consolidation or other moves, the survey said.

The survey said users' intentions for future mainframe purchases also reflect a decline, dropping to a little more than half the number of planned systems from a year ago.

# AP braces for election finale

CONTINUED FROM PAGE 77

didn't have hot spares of everything," Friedman said. "With the increased power of VAXs over PDPs we could afford to put multiple bureaus on a single system, and with clusters it became fairly easy."

Now if a machine goes down, extra processors are available to take over, and additional ones can act as backups. Instead of leaving the extra VAXs to idle when they are not required as backups, the processing load is distributed across the cluster.

"The cluster architecture has been very helpful in giving us a reasonably cost-effective, high-availability solution," Friedman said. "There are worlds of difference in what we are now capable of doing — in real time, the PDPs would take forever to get a response back. Now we have all kinds of searching capabilities and real-time access to around 13,000 news items."

The AP began its transition to VAXclusters four years ago, and the organization's Boston bureau was the last to make the move this spring.

THE AP CHOSE to replace the 25-year-old PDP technology in hopes of gaining more reliable and quicker access to material.

"The system we had before was in pretty bad shape by the end — it was pretty slow and would crash a lot," said Eve Epstein, statehouse reporter at the AP in Boston. "There were times when we lost stories."

"The major changes have been increased reliability because we have a VAX that has in effect two backup VAXs," said Dan Beegan, statehouse bureau chief for the AP in Boston.

"That solved the old problem when each bureau only had its own. By the time they were replaced, those machines were very antiquated, and though it didn't happen frequently, there would be times when we'd be down for several hours," Beegan said.

**Staffers mark** *the departure of the last VAX PDP-8E running in news production at the AP*

The new system lets users work on-line without loss of material a minute or so after the operation moves to another VAX on the cluster.

The news system is now running APedit, a PC editor that the AP customized itself. The AP also added electronic mail with the VAXcluster upgrade via A1, a stand-alone E-mail package from DEC.

While the news bureaus run their operations off the VAXclusters, the AP also has an election vote-tabulation system that is based on a network of Sun Microsystems, Inc. 470s. It was originally based on Motorola, Inc. 68020- and 68030-class multiuser systems.

When the AP made its decision to move from the Motorola platforms, the company chose Sun with a Sybase, Inc. relational database management system for the vote-tabulation system, based on price/performance issues and DEC's lack of commitment to Unix at the time of the decision.

"We ultimately chose to go with Unix over VMS to hedge our bets and to gain expertise in Unix so that we would have flexibility in terms of future directions," Friedman said. "The message at DEC about Unix was very confused and it still hasn't settled down now."

The AP's information systems department will upgrade the Sun 470 workstations to 670s before November's presidential election in preparation for the "big bang" on election night, when it must handle more than 400,000 transactions.

# DEC releases tools for DECmpp

BY MELINDA-CAROL BALLOU
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. announced that it has enhanced a range of software tools for the company's massively parallel DECmpp 12000 series of computers. It has also provided higher-density parallel disk array systems and a new high-speed console.

Products that were part of the announcement include DECmpp Fortran V1.1; DECmpp Vast-2, which translates conventional Fortran 77 programs into DECmpp Fortran; DECmpp Math Library; DECmpp Image Processing Library and DECmpp Parallel Programing Environment.

DECmpp Fortran V1.1 is a new release of DEC's parallel Fortran compiler, which features automatic scalarization allowing massively parallel programs to be developed and tested on conventional workstations, officials said. DECmpp Vast-2 is new software that can translate portions of conventional Fortran 77 programs into DECmpp Fortran, optimizing it for massively parallel systems.

The DECmpp Math Library is a store of frequently used mathematical routines that can be invoked during program development. The DECmpp Image Processing Library includes new data types for use in a range of image processing applications. DEC's DECmpp Parallel Programming Environment now offers support for the Open Software Foundation's Motif graphical user interface, links to AVS graphical visualization software and performance improvements, officials said.

DEC, which is currently reselling Single Instruction Multiple Data (SIMD) computers from Masspar Computer Corp. and Multiple Instructions Multiple Data (MIMD) systems from Intel Corp., seeks to offer a unified software environment across architectures.

"We are headed toward a unified software environment across SIMD and MIMD machines. This compiler is a big step forward toward our goal of a high-performance Fortran compiler across environments, and we're looking to do that with our development tools as well," said Bob Nilsson, marketing manager for DEC's massively parallel systems group.

### In the works

DEC is working on its own massively parallel systems in-house, according to industry analysts, although DEC officials refused to comment. Other vendors, such as Cray Research, Inc., are licensing DEC's Alpha chip to develop massively parallel systems, Nilsson said, noting that it is "quite conceivable" that DEC might do the same.

Analysts were positive in their assessments of DEC's massively parallel software.

"DEC is trying to provide the software across their panoply of vendors that will make it all work. This will be how they glue it all together," said George Lindamood, vice president of high-performance computing at Gartner Group, Inc. in Stamford, Conn. "They have quite correctly judged that the world out there can use some better software, and they will be able to use it later on for whatever they do in-house. Their plate is very full in the short term, since they are trying to get Alpha out."

# Neon unveils Shadow for IMS

BY TOM HOFFMAN
CW STAFF

HOUSTON — Neon Systems, Inc. has rolled out two software products designed to provide client systems with access to mainframe databases.

Shadow for IMS allows client programs on Unix-based personal computers or workstations to access databases under IBM's IMS mainframe database management system. Using Shadow for IMS, users can access and update IMS message queues and execute IMS application programs using Unix workstations.

Shadow for IMS can be used on any platform that supports the C programming language, according to the company.

Shadow Gateway for DB2 allows Sybase, Inc.'s Open Client applications to communicate with IBM's DB2 database.

Each of the products offers monitoring and diagnostic facilities for controlling large-scale client/server applications. Connections between client systems and the mainframe are established through either Transmission Control Protocol/Internet Protocol or the LU6.2 networking protocol. The products run on any IBM or plug-compatible mainframe running IBM's MVS/XA or later release.

Pricing for both products ranges from $9,950 to $55,000, depending on configuration.

## NEW PRODUCTS

### System software

Diversified Software Systems, Inc. has announced Release 5.6 of Docu/Text, an MVS JCL documentation and analysis productivity tool.

Performance improvements have been made in this release, which responds to new functions in the IBM MVS/ESA environment. New DB2 functionality has also been added.

By reading JCL as input, the product automatically provides a variety of reports and flow charts. On-line job information for operations is provided by an Online Info feature, and Online XREF offers enterprisewide, cross-reference information that is contained in a central repository.

Pricing for Docu/Text ranges from $17,600 to $55,000.

**Diversified Software Systems**
**18630 Sutter Blvd.**
**Morgan Hill, Calif. 95037**
**(408) 778-9914**

### Software application packages

NCR Corp. has released recognition capabilities for its image-based Document Management System.

The imaging system can now recognize handwritten numbers, machine-printed characters and numbers and multiple fonts on a single document, the company reported. Paper documents can be converted to electronic form. The product can recognize omnifront machine print, optical character recognition, bar codes and adding machine tape.

Prices start at $800,000 for a 20-workstation system.

**NCR**
**1700 S. Patterson Blvd.**
**Dayton, Ohio 45479**
**(513) 445-2078**

CHI/COR Information Management, Inc. has announced a new demonstration disk for the Deduction Management System (DMS).

The disk introduces financial implications of the deduction problem and also describes the productivity benefits that can be achieved by using DMS to resolve customer deductions.

The disk also demonstrates the capabilities of DMS, which is a mainframe-, Application System/400- or personal computer-based tool designed to help users monitor, control and track customer deductions, according to the company. DMS automates and formalizes an organization's deductions resolution process.

Pricing ranges from $9,500 to $95,000, depending on system configuration.

**CHI/COR Information Management**
**300 Wacker Drive**
**Chicago, Ill. 60606**
**(312) 322-0150**

Datathon, Inc. has announced a starter pack for TrainEase, a computer-based training software package.

Version 3.0 of TrainEase is a personal computer-based multimedia training program for designing presentations, tutorials and instant simulations, the company reported. The product can be used with the IBM Application System/400, and it offers support for sound and graphic file formats that are compatible with Microsoft Corp. Windows 3.0 or later.

TrainEase features instant recording of all screens and keystrokes plus authoring and design capabilities to guide users through the training session.

Prices start at $1,492.

**Datathon**
**19360 Rinaldi St.**
**Northridge, Calif. 91326**
**(818) 701-9642**

### Database management

BMC Software, Inc. has released Version 4.2 of Delta IMS.

The product now supports Fast Path Data Entry Databases and several new terminal types. Delta IMS is available in three product levels: Delta IMS DC, Delta IMS DB/DC and Delta IMS Virtual Terminal. The ability to add, delete or modify the database and data communications elements of IMS on-line is achieved with Delta IMS.

According to the company, by reducing the number of IMS generations needed, the Delta IMS DC and Delta IS DB/DC increase system availability and improve responsiveness to users. Delta IMS Virtual Terminal permits devices such as automated teller machines and teller printers to be added to the IMS system.

Perpetual licenses for all three of the products start at $11,000.

**BMC Software**
**1 Sugar Creek Center Blvd.**
**Sugar Land, Texas 77487**
**(713) 240-8800**

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### DBMS USER SURVEY

| | PROGRESS SOFTWARE | SYBASE | INFORMIX | INGRES | FOCUS | ORACLE |
|---|---|---|---|---|---|---|
| ATTRIBUTES | | | | | | |
| Reliability | 9.3 | 8.7 | 8.9 | 8.1 | 7.7 | 8.8 |
| Ease of Use | 9.1 | 8.2 | 8.2 | 7.9 | 7.9 | 7.4 |
| Ease of Install/Upgrade | 8.9 | 8.0 | 8.8 | 7.1 | 8.1 | 7.6 |
| Prica/Perform Return | 9.1 | 8.3 | 8.5 | 7.5 | 8.1 | 7.1 |
| FUNCTIONALITY | | | | | | |
| Flexibility | 9.1 | 8.8 | 8.6 | 9.0 | 8.4 | 8.6 |
| Interface Capabilities | 8.9 | 8.9 | 8.4 | 8.7 | 8.7 | 8.0 |
| Comprehensivaness | 9.1 | 8.8 | 8.8 | 8.3 | 8.7 | 8.7 |
| User Friendliness | 8.9 | 7.7 | 8.3 | 7.9 | 7.5 | 7.3 |
| OS Compatibility | 9.6 | 8.4 | 8.9 | 9.1 | 8.8 | 9.0 |
| PRODUCT SUPPORT | | | | | | |
| Documentation | 9.0 | 8.2 | 8.6 | 5.7 | 6.2 | 7.3 |
| Vendor Training | 8.7 | 7.9 | 8.0 | 7.2 | 7.6 | 8.0 |
| Problem Response Time | 8.8 | 7.5 | 7.2 | 6.1 | 6.4 | 6.7 |
| Quality of Vendor Support | 9.0 | 7.8 | 7.5 | 6.4 | 6.9 | 7.0 |
| Frequency of Ralaasas | 8.5 | 7.5 | 6.7 | 7.2 | 7.7 | 7.2 |
| Response to User Request | 8.8 | 7.5 | 7.8 | 7.0 | 7.0 | 7.3 |
| **Overall Satisfaction** | 9.3 | 8.7 | 8.5 | 8.3 | 8.0 | 7.9 |

Compiled from the 1991 Datapro Reports on Software/Computer System Series Software, available for each product listed (Sybase from 1992). The results are those of actual users of the products as surveyed by Datapro.

## VARBUSINESS
### DBMS REPORT CARD

| | PROGRESS SOFTWARE | INFORMIX | ORACLE | ASHTON-TATE | INGRES |
|---|---|---|---|---|---|
| PRODUCT FEATURES | | | | | |
| Ease of use | 9.02 | 7.07 | 6.00 | 6.19 | 5.90 |
| Mamory requirement | 7.37 | 6.16 | 4.25 | 6.19 | 5.22 |
| Ease of programming | 9.03 | 7.09 | 6.06 | 6.20 | 5.90 |
| Ability to manipulate data | 9.19 | 7.41 | 7.44 | 6.81 | 5.67 |
| Sorting capabilitias | 9.02 | 7.44 | 7.69 | 6.65 | 5.78 |
| Provision for software security | 8.56 | 6.93 | 7.28 | 5.07 | 5.78 |
| Report writing capabilities | 8.39 | 6.72 | 6.59 | 5.71 | 4.11 |
| Ease of use of interface | 8.51 | 7.05 | 6.15 | 6.10 | 6.10 |
| Software intagration capabilities | 8.34 | 7.26 | 7.24 | 6.27 | 6.10 |
| Ease of data retrieval | 9.08 | 7.68 | 7.66 | 6.61 | 6.11 |
| Satisfaction with product profitability | 8.26 | 7.04 | 6.22 | 5.58 | 5.13 |
| Overall quality of product | 8.94 | 7.37 | 6.69 | 6.32 | 5.44 |
| **Product Features Average** | 8.64 | 7.10 | 6.61 | 6.14 | 5.60 |
| SUPPORT FEATURES | | | | | |
| Provision for customer support | 7.74 | 5.98 | 5.76 | 5.77 | 5.50 |
| Charges for training time | 6.88 | 4.49 | 4.59 | 5.64 | 4.56 |
| Provision for technical support | 7.81 | 5.76 | 5.72 | 5.87 | 5.22 |
| Provision for marketing support | 6.89 | 5.88 | 6.09 | 6.13 | 3.80 |
| Documentation & product information | 8.74 | 6.73 | 6.56 | 6.45 | 5.56 |
| Frequency of updates & revisions | 8.35 | 5.88 | 6.34 | 5.57 | 5.00 |
| **Support Features Average** | 7.73 | 5.79 | 5.84 | 5.90 | 4.94 |
| **Overall Average** | 8.34 | 6.66 | 6.35 | 6.06 | 5.38 |

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Rated on everything from performance and reliability to service and support, Progress trounces all of its competitors in the 1991 Datapro user surveys and the 1991 Varbusiness Software Report Card.

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CPWADV0907

# KnowledgeWare promises better module integration

BY KIM S. NASH
CW STAFF

ATLANTA — The latest release of Application Development Workbench (ADW), the integrated computer-aided software engineering system from KnowledgeWare, Inc., should appease users seeking smoother interaction between modules and more sophisticated diagrammers.

Like many KnowledgeWare users, the *Minneapolis Star Tribune* wanted to see better integration between ADW's design and construction stations. Kim Albee, a member of the newspaper's research and integration team, said that under ADW 1.6, the current version, some of that link has to be built manually by the programming staff.

"You have to copy your spec diagram files and paste them into the [generator] module. That kind of thing should be automated," Albee explained. "We have a lot of expectations for 2.7 and hope KnowledgeWare delivers," she said.

Albee is not alone, acknowledged Brett Roeder, a KnowledgeWare product manager. "We realized the need to get the front-end tools working better with the back end and have taken care of that," Roeder said.

ADW 2.7, which is due out before year's end, is currently in beta testing at 80 U.S. customer sites. As revealed in a recent product demonstration, the tool set sports enhancements to all phases of full life cycle development.

That is good news for businesses such as Vons Cos., a Los Angeles-based chain of food stores. Vons attempted a pilot project using ADW 1.6 and got through analysis and design. However, time pressures forced the company to abandon efforts to generate code with ADW and revert to Computer Associates International, Inc.'s CA-IDMS programming.

The pilot grew too large for Vons' programmers to handle, explained Barry Boone, director of corporate systems. "And when the heat got on, we went back to what we knew, what was easy," Boone said.

With 1993's schedule of information systems projects laid out, Vons expects to allocate at least one system to a team equipped with ADW 2.7 next year. "We don't doubt that 2.7 will be much improved," Boone said.

A key difference between Release 1.6 and the new version is how Construction Workstation relates to Design Workstation. "The generator is nothing but an engine now. All the construction specifications are defined in the design phase," Roeder said. Version 1.6 depended on the code generation module to lay down at least some of the program specifications.

### Improved translation

The product preview highlighted improvements in translating business requirements into application code. For example, ADW/RAD, a facility for doing rapid application development, now lets programmer/analysts use data and process models formed during the analysis phase serve as the basis for workable application prototypes.

The information used to create test programs can later be used to build actual applications, said Pam Johnston, director of product management.

For the North Carolina Department of Administration, that enhancement comes too late to be of use on a 1,000-program computerized judicial tracking system. Based in Raleigh, N.C., the state agency is one year into what is expected to be a three-year project. The department is finished with the analysis portion of the task and plans to start building prototypes during the design phase, according to Ray Speight, application development manager.

However, functionality of the RAD and Documentation modules in ADW 1.6 is not up to snuff, Speight said. "I think they released them too early," he said.

Speight asked KnowledgeWare whether he should wait for 2.7 to come out and use the new construction tools or complete the current project with 1.6. "They are encouraging us to start a fresh project with 2.7 when we get it. I guess it's not easy to make the transition from one release to another," he explained.

Meanwhile, the department will build pseudo-prototypes by tacking ADW-generated interfaces and screens onto interim code programmed manually by in-house staff. "It's not prototyping in the true sense of the word, but it'll do," Speight said.

### Key enhancements to KnowledgeWare's CASE Workbench

- **Planning and analysis phases:**
  Diagrams and reports to cover entire life cycle.
  Translation of business process models into working data models.
- **Rapid Application Development Module:**
  Automated prototype design that can be translated to Design Workstation tool.
- **Design and construction phases:**
  Enhanced screen painter, syntax checking functions.
  Expanded support for IBM's DB2 and Cross System Product.
- **Documentation and maintenance phases:**
  Documentation built via templates; can include graphic elements.
  LAN administrator functions, license control.

CW Chart: Janell Genovese

# Change managers speed re-engineering

BY GARRY RAY
CW STAFF

In today's business lexicon, "change management" does not have quite the weighty clout of "re-engineering" or "downsizing." But according to analysts and users, the change management tools used by application developers might play a central role in any corporate re-engineering or downsizing effort.

"These tools are absolutely critical to client/server development and deployment," said Steven Bradley, program director at market research firm Gartner Group, Inc. in Stamford, Conn.

Represented by tools such as CCC/Manager from Softool Corp. in Goleta, Calif., and Endevor from Legent Corp. in Alexandria, Va., change and configuration management tools allow developers to maintain rigid control over different versions of application code, documentation, change authorizations and other elements of the software development process.

By storing these elements in "libraries" and providing tools for tracking, updating and merging them with other elements, change and configuration management products can assure developers that they are working with the most recent version of any application element.

In addition, change and configuration management tools generally provide clear audit trails showing who made changes to a particular module and why those changes were made.

Those auditing features were crucially important to Susan Kuwana, an information management technologist at User Technology Associates, Inc., an Arlington, Va., services contractor to the U.S. government.

Kuwana explained that a contract protest involving a previous employer required that "we go back to justify and explain why paragraphs and sentences had changed in a 1,000-page contract" that included development specifications.

Because the contract had been tracked using Softool's CCC/Manager, "we were able to do it in 20 or 30 minutes," she said.

Kuwana is currently implementing CCC/Manager at User Technology Associates because "how we control changes internally is inherently part of our contract," she said.

### Software librarian

To do this tracking of code and documentation, most change and configuration management software operates in a manner analogous to a library: The development staff "checks out" and "checks in" the program elements they intend to review, modify or test.

To reduce the amount of disk space used by these multiple versions of program elements, only the changes, or "deltas," made to an existing element are stored in the change and configuration management system. At various points in the process, deltas and original program elements are merged to build updated versions of the application.

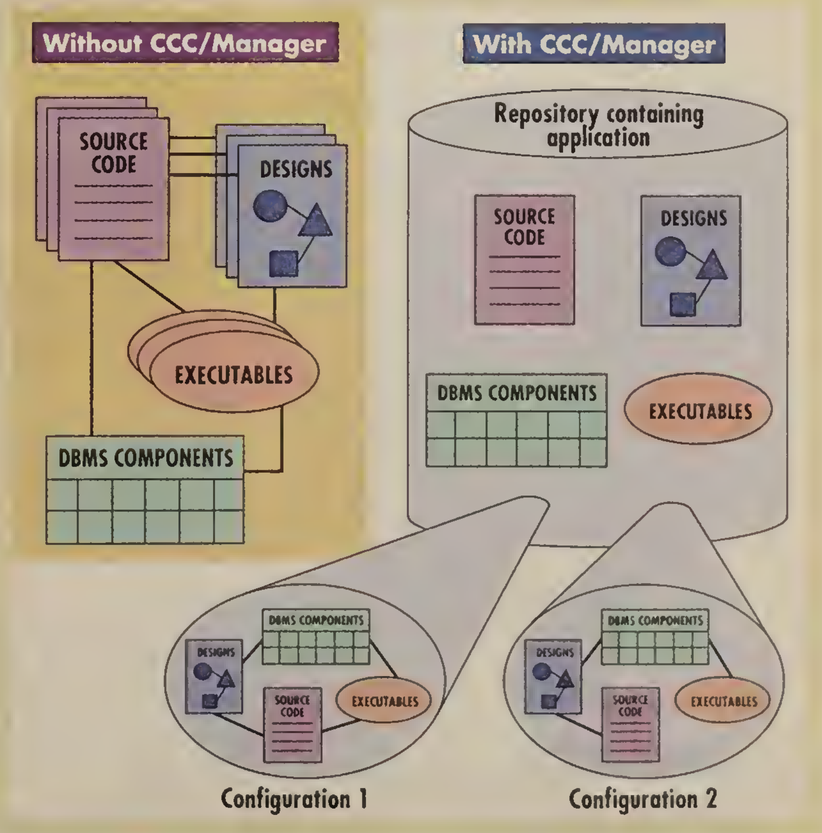
While these extra steps may seem like onerous additions to the coding cycle, development staffs have taken kindly to the process. A Chicago-area administrator of Legent's Endevor change and configuration management software said programmers had embraced the tool in order to improve software quality.

Few of these capabilities were important in the days of the lone coder working on a single application. But that's changing quickly. "We're seeing multiplatform development becoming an issue today," said John Treacy, product director at Rockville, Md.-based Intersolv, Inc., which sells the

*Continued on page 82*

### User views

*Configuration managers such as Softool's CCC/Manager let users define multiple versions of an application*



Source: Softool Corp.

CW Chart: Stephanie Faucher

# Passport aids fast applications generation

BY MELINDA-CAROL BALLOU
CW STAFF

RONKONKOMA, N.Y. — InSynch Software Corp. last week announced the release of Passport6, which combines the firm's Passport development environment with a rapid application generator and a GUI customizer for quick generation of applications across operating systems and relational database management systems.

This version of InSynch's development tool integrates an easy-to-use graphical user interface (GUI) with the Passport fourth-generation language and automates RDBMS access across Oracle, Sybase, Ingres, Rdb, Unify and Sequoia Systems, Inc.'s FT/SQL RDBMSs.

"Someone who has never used Passport can now build a five- to 10-screen application in a day, and someone with two months' experience can build an advanced abstract widget such as a spreadsheet with a GUI format in three to four days," said Keith Sturges, vice president of sales at InSynch. "And you can now deploy a Passport application on VMS or Unix machines using either character mode or a GUI with the same application. The majority of the code remains the same."

Passport is an object-based, SQL application development environment designed to create portable, high-performance GUI and/or character-based applications. Passport's objects (including Menus, Menu Items, Forms, Screens, Blocks, Fields, Scrolls, Text, Overlays, Reports and SQL-Object) are implemented as abstract data types and possess dynamically queriable and modifiable attributes.

Menu styles can be modified at runtime under user control because the application menu hierarchies are abstract models that are independent of user interface representation and navigation style.

Since Passport's objects are separate from programming logic, it is possible for developers to separately reuse Passport object and logic modules. The advantages of this are that the amount of logic needed to manage Passport objects is minimized and that programmers can build their own generic Passport utilities if they so choose.

Passport is fully structured and procedural but supports nonprocedural SQL by storing SQL statement blocks as callable, named objects. Those SQL objects are then modular and can be reused.

"Passport is like a universal translator that lets us draw information from different databases and pull it together into a single screen," said John Keeran, a database administrator at Peterson Air Force Base in Colorado Springs. "This is especially important for me because in the military we have different installations with different levels of hardware and software."

With the new version of Passport, Keeran said, he can simply relink the old application to make it a GUI application. He said he looks forward to a Microsoft Corp. Windows version of Passport6 on DOS, which InSynch officials said they expect to ship by the end of the year.

Other advantages to Passport include its flexibility and ease of use, Keeran said.

"I've programmed with both Oracle and Unify tools, and those have a set of instructions for screens and another for report generation. Just having to learn one set simplified the process for me."

VMS and Unix versions are available now, priced from $1,500 to $45,000.

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# Speeding re-engineering

CONTINUED FROM PAGE 81

PVCS version control software for DOS, OS/2 and AIX. The company also provides a gateway to IBM's SCLM mainframe change and configuration management software.

Add to multiplatform development the desire for programs that can run on multiple operating systems and have different user interfaces, such as Microsoft Corp.'s Windows and OSF/Motif, and development complexities grow rapidly. The Endevor administrator in Chicago said the tool had significantly reduced that complexity.

Paradoxically, as development efforts become more ambitious in their scope and size — multiplatform client/server applications being the best example — change and configuration management products might become more crucial to the success or failure of a project.

According to Bradley, "Software change management will be the gating factor" in future software projects.

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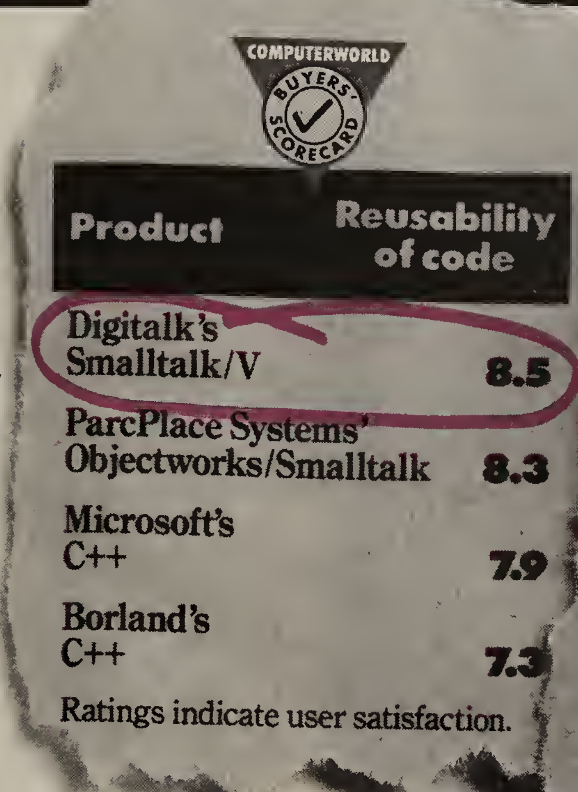
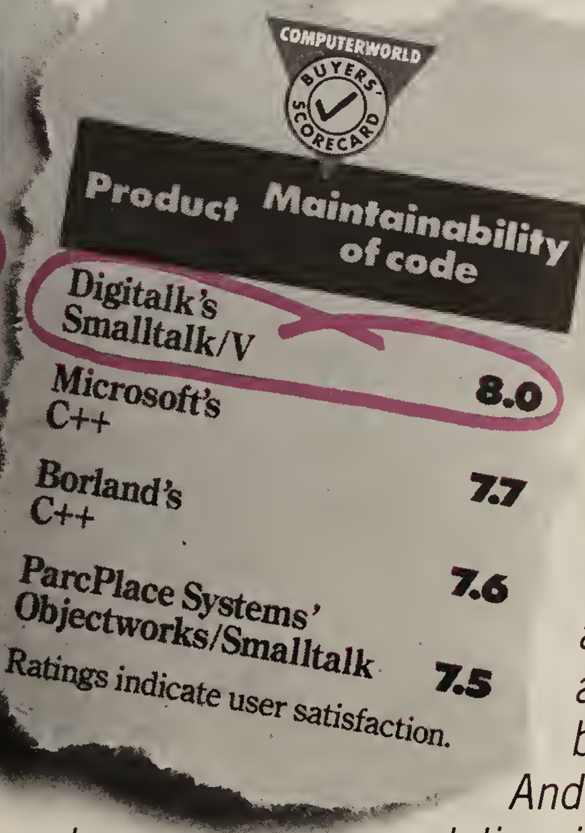


COMPUTERWORLD BUYERS' SCORECARD

| Product | Reusability of code |
|---|---|
| Digitalk's Smalltalk/V | 8.5 |
| ParcPlace Systems' Objectworks/Smalltalk | 8.3 |
| Microsoft's C++ | 7.9 |
| Borland's C++ | 7.3 |

Ratings indicate user satisfaction.



COMPUTERWORLD BUYERS' SCORECARD

| Product | Maintainability of code |
|---|---|
| Digitalk's Smalltalk/V | 8.0 |
| Microsoft's C++ | 7.7 |
| Borland's C++ | 7.6 |
| ParcPlace Systems' Objectworks/Smalltalk | 7.5 |

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## NEW PRODUCTS

### Application development tools

Kansmen Corp. has announced upgrades on six modules in the ToolsKan Development Toolkit Version 2.0.

The six modules are 3Dchart, Status Bar, Toolbox, Table, Ribbon/Icon Bar and Field Validation. The 3Dchart module can produce pie charts and supports printing and scrolling and features a clipboard for long series of data.

ToolsKan's Toolbox can create buttons from bitmaps or text and supports scrolling for a large number of buttons, the company reported.

All of the modules are written in Microsoft Corp.'s C Version 6.0 and are compatible with Version 7.0, Borland International, Inc.'s C/C++, Turbo Pascal and Quick C.

Version 2.0 costs $1,299. An upgrade from the previous version costs $299.

**Kansmen**
**2080-C1 Walsh Ave.**
**Santa Clara, Calif. 95050**
**(408) 988-0634**

Integrated Systems, Inc. has introduced Xmath Version 1.1, a numerical analysis tool.

According to the company, Xmath is the first mathematical analysis tool designed for X Window System workstations. A programmable graphical user interface allows users to create and run interactive design tools from the Xmath environment. The product also has a high-level scripting language and interactive color graphics.

New features include a callable interface and the capability to link C, C++ and Fortran functions.

The product is available for Sun Microsystems, Inc. SPARCstation-compatible workstations and Digital Equipment Corp.'s DECstations.

Prices start at $2,500.

**Integrated Systems**
**3260 Jay St.**
**Santa Clara, Calif. 95054**
**(408) 980-1500**

Language Systems Corp. has released SoftPolish, a quality assurance tool.

According to the company, SoftPolish tests the dialogues, windows and controls of an application for compliance with Apple Computer, Inc.'s Human Interface guidelines.

For resource validity, the product applies numerous tests and can identify potential incompatibilities. All of the string objects in application resources are spell-checked, and SoftPolish automates file cleaning for master disks.

SoftPolish costs $295.

**Language Systems**
**441 Carlisle Drive**
**Herndon, Va. 22070**
**(703) 478-0181**

Step Engineering has announced RightStep, an OSF/Motif graphical user interface for GDB, a debugger from Free Software Foundation, Inc.

The product was designed to accelerate development of complex C and C++ applications.

RightStep has the ability to set or clear breakpoints by source line number, function name or exact address and examine stack frames with their function call arguments, executing location and local variables.

A variety of features are included, such as control processing of asynchronous signals to the program and a change execution path to simulate difficult-to-trigger errors. C and C++ users on a Sun Microsystems Inc. SPARC workstation network can access the tool.

RightStep costs $850 for a network license with two tokens. A four-token license costs $1,450.

**Step Engineering**
**661 E. Arques Ave.**
**Sunnyvale, Calif. 94088**
**(408) 733-7837**

### Languages

Apple Computer, Inc. has introduced Version 2.0 of the Macintosh Common LISP, a LISP programming environment.

The product is fully integrated with the Macintosh personal computing platform. Common LISP is an object-oriented dynamic language that provides automatic management, simplifying the creation of complex applications, the company reported.

Macintosh Common LISP 2.0 costs $495.

**Apple Computer**
**20525 Mariani Ave.**
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### Code libraries

Data Access Corp. has released two products designed to provide users with the ability to read and write data in DataFlex databases.

The Data Access Database C-Library enables users to write stand-alone C and C++ programs that manipulate data located in the existing database system.

Any Microsoft Corp. Windows-based program that can use Dynamic Link Libraries (DLL) can access data stored in DataFlex data files with the Data Access Database Windows DLL.

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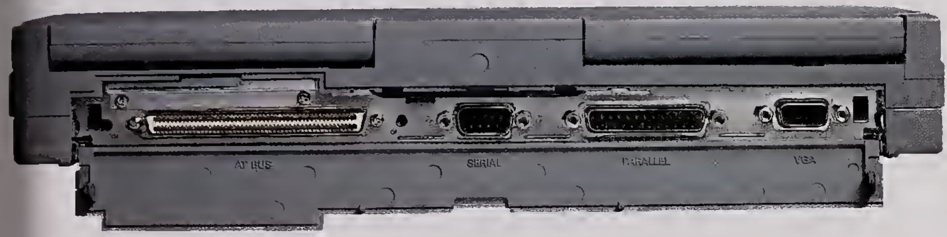

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**DECpc 325P**

| | COLUMN A<br>**Base system** | COLUMN B<br>**OPTIONS (circle your choices)** |
|---|---|---|
| Microprocessor: | Intel 25MHz i386SL | 25MHz 80387SL 25MHz Coprocessor |
| Memory: | 2MB | Upgrade to: 4MB, 6MB, 8MB |
| Storage: | 3.5" 1.44MB Floppy, 80MB IDE Hard Disk | Upgrade to: 120MB IDE Hard Disk |
| Display: | 10" Triple Super Twist Backlit VGA LCD | External 14" VGA Color Monitor |
| Keyboard: | 84-key with inverted T cursor keys | Extended 101-key Industry Standard |
| Pointing Device: | Built-in Trackball Logitech TrackMan Portable | |
| Communication: | Serial, parallel port | 9600 baud FAX/Modem Pocket Ethernet |
| Battery: | 4-hour NiMH | Extra Battery Pack |
| Software: | MS-DOS 5.0, Windows 3.1, QA Plus Diagnostics, Choice of Lotus Software | |
| Carrying Case: | Black Nylon | Black Leather |
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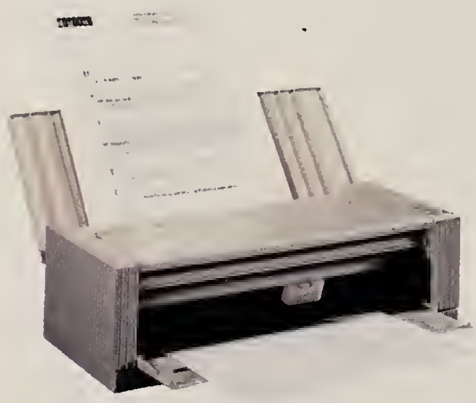
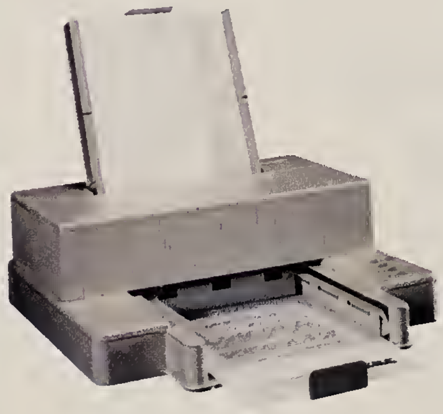


| | |
|---|---|
| Print Technology: | Bubble ink-jet with 50-nozzle printhead |
| Printer Speed: | Up to 160 characters per second |
| Print Resolution: | 300 x 300 dots per inch |
| Paper Handling Sizes: | 8.5" x 11"; 8.5" x 10.5"; 8.5" x 14" |
| Envelope Handling Sizes: | Standard office envelopes<br>Maximum width: 9.5", Maximum length: 4.3" |
| Paper Thickness: | 19-24 lbs. (70-90 g/m2)<br>Up to 36 lbs. manual feed |
| Print Modes: | Portrait and landscape |
| Optional Memory Upgrade Cards: | 256KB |
| Resident Fonts: | Courier, Courier Landscape, Times Nordic (Times Roman)<br>Proportional spacing, Letter Gothic |
| Cartridge Slots: | One (for font or emulation cartridges or RAM cards) |

DECjet 1000 Order No.: FR-LJ16P-AA Price: $329

## DECjet 2000: Handles larger print runs with speed and reliability.



| | |
|---|---|
| Print Technology· | Bubble ink-jet with 50-nozzle printhead |
| Printer Speed: | Up to 360 characters per second |
| Print Resolution: | 300 x 300 dots per inch |
| Paper Handling Sizes: | 8.5" x 11"; 8.5" x 10.5"; 8.5" x 14" |
| Envelope Handling Sizes: | Standard office envelopes<br>Maximum width: 9.5", Maximum length: 4.3" |
| Paper Thickness: | 19-24 lbs. (70-90 g/m2) Up to 36 lb. manual feed |
| Print Modes: | Portrait and landscape |
| Optional Memory Upgrade Cards: | 256KB |
| Resident Fonts: | Courier, Courier Landscape, Times Nordic (Times Roman)<br>Proportional spacing, Letter Gothic |
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COMPUTERWORLD SALARY SURVEY 1992

# THE BUCK STOPS HERE

*As recession grinds on, IS pros lucky enough to have jobs are working harder for slimmer paychecks, especially managers and women*

BY KELLY E. DWYER

If you want to bring home more bacon this year, you're going to have to work twice as hard. If you're a woman, you'll probably have to work twice as hard as that.

In other words, the salad days are over, replaced by a few small carrots.

*Computerworld's* annual salary survey of 1,478 information systems managers and professionals found that, with a few exceptions, total compensation has generally dipped slightly from last year, ending five years of declining growth.

Management- and networking-related titles, including chief information officer, IS director and network manager, suffered the worst declines — up to 9%. Most of the modest hikes, all less than 5%, were given to programmers and other nonmanagement professionals (see chart page 86).

The dreary results were blamed on the recession and rising unemployment, according to IS managers, recruiters and compensation consultants.

"In the '80s, money was being tossed around like crazy," notes David Raciti, vice president at Corico Recruiters in Salem, N.H. "Now, in the '90s, everybody's watching their bottom lines — not just salaries, but on the cost of everything: cost of benefits, cost of hiring, cost of agency fees."

Typical of companies trying to rein in IS personnel costs is Phillips Petroleum Co. The Bartlesville, Okla., firm had companywide layoffs after a restructuring during the first quarter.

One result, says Jim Gottardi, manager of application services at Phillips, was that "people didn't get bonuses and the pay increase they may have been accustomed to receiving."

To make things tougher, the IS department was also shrunk about 20% as part of a corporate downsizing, Gottardi adds.

Observers agree that many companies are playing it safe by putting a bit more money into IS bonuses and less into base salaries. That way, explains Jay Gaines, placement specialist at Jay Gaines & Co. in New York, fixed costs can be more easily managed.

Indeed, modest bonuses are emerging as a favored bonbon for hard-working survivors in downsized, rightsized, restructured and generally slimmed-down organizations.

"The people left in many of these positions are the people who are the real producers, the achievers," notes Norm Sanders, managing director at Norm Sanders Associates, Inc. in Hazlet, N.J. "These people are working very hard, and they deserve to be compensated for doing more with less."

### Still small bonuses

The bonus increases over last year, however, are still below 1990 levels and are hardly spectacular. The biggest boost, for operating systems programmers, was less than $650. And only about one-third of the respondents received any bonus at all.

CIOs managed an average of $7,242 in bonus, a drop of $450 from 1991 and $1,350 from 1990. Average bonuses for IS managers also declined, from $4,639 to $3,903.

One group apparently doing the same or more for less pay is women.

On average, women's IS salaries, which *Computerworld* surveyed as a separate category for the first time this year, were lower than men's in every category.

The pay gap, about 2% for programmers, worsens higher up the hierarchy, swelling to 21% for top IS directors, the survey found (see chart

*Continued on page 86*

**1992 SALARY SURVEY**

## Main points

- Thanks to the recession, total compensation is down 1% to 9% for most titles.
- Women polled earn up to 21% less than men.
- Benefits have become more important.
- Modest performance bonuses are more common for some jobs.

David Strick

**IS manager Jackson:** *'Once again, it's a matter of [women] proving ourselves'*

---

Dwyer is a *Computerworld* assistant editor, features.

# The buck stops here

CONTINUED FROM PAGE 85

page 1). Such differences clearly anger some women.

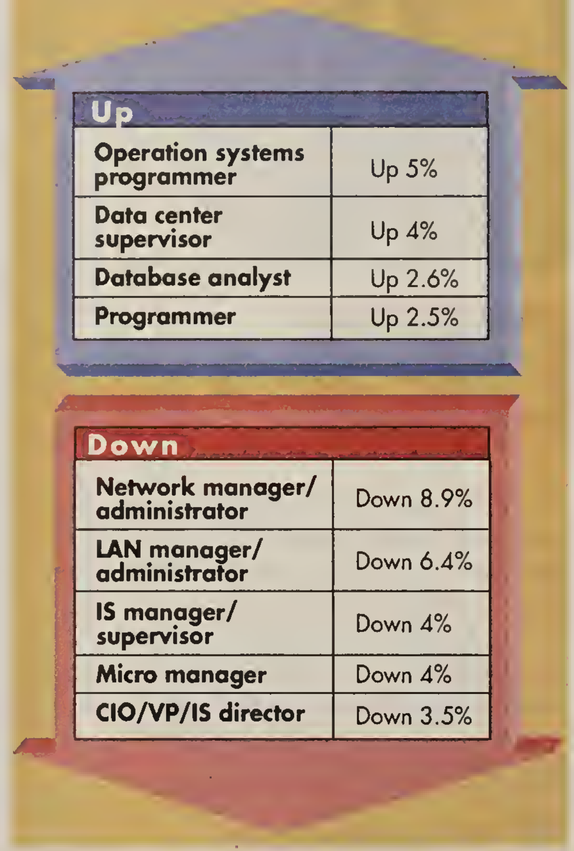
"Performance is performance," according to Suellen Jackson, MIS manager at a community bank in California.

"If the person is performing, I don't care who, what gender, color, or whatever — let's identify the job description, let's identify the performance, and pay based on that," she continues. "It's such an old story; you'd think by now we would've gotten a clue."

## 1992 SALARY SURVEY

### Ups and downs

*Surprisingly, traditional IS jobs fared better than more network-oriented and top management positions in this year's salary survey*



**Up**

| | |
|---|---|
| Operation systems programmer | Up 5% |
| Data center supervisor | Up 4% |
| Database analyst | Up 2.6% |
| Programmer | Up 2.5% |

**Down**

| | |
|---|---|
| Network manager/ administrator | Down 8.9% |
| LAN manager/ administrator | Down 6.4% |
| IS manager/ supervisor | Down 4% |
| Micro manager | Down 4% |
| CIO/VP/IS director | Down 3.5% |

Ideas about reasons for the disparity vary. Some blame women themselves for the gap.

James Hackett, director of legislative data systems at the Rhode Island General Assembly in Providence, says he believes that women tend to assume traditional, lower-level IS roles and lack aggressiveness.

"I'm critical of [women] that work for me that don't demand more and that haven't sought management positions," he says. "A 10- to 12-year [female] employee with full knowledge of the system should be banging on my door every quarter saying 'When am I going to become the assistant director?' "

Terry W. Mattix, MIS director at Delta Consolidated Industries, Inc. in Jonesboro, Ark., speculates that some women might be less inclined to move around because of family obligations. But he adds that many women now seem more comfortable with jumping to another company for higher pay.

"They're saying: 'If I stay with this company, I'll get the standard 3% raise a year. But if I take my same skills to another company, they'll pay me 10% more right now,' " Mattix says.

### Still a minority

Jackson notes that women remain a minority in IS, especially in management positions. (In our survey, men outnumbered women approximately 4 to 1 overall.) As a result, she says, it's harder for women in IS than those in other fields to get equal pay.

Joseph Biskner, director of MIS at Stevens Van Lines, Inc. in Saginaw, Mich., points to an even more basic problem. "It's still a pretty chauvinistic world, unfortunately," he says. "But that's true in the world in general, not just the IS world."

Further complicating the matter is that the issue of gender pay is emotional, delicate and discussed so quietly it almost seems taboo. Several consultants and recruiters, for instance, declined to comment on the topic.

Moreover, not everyone agrees that a problem exists. Cynthia McFarland, MIS manager at The Philanthropic Mutual Life Insurance Co. in Norristown, Pa., acknowledges that male executives at her firm earn more than she does.

But she notes they have been at the company longer, so she presumes the difference in salary reflects their greater experience. "At least I would hope so," she says.

Some recruiters even argue that women in IS can earn *more* than male colleagues. "If you have a man and a woman negotiating for the same opportunity, the woman tends to get certainly equal but maybe more," Sanders says, "because firms are interested in women, and there aren't enough to fill the demand."

### Earn your pay

But regardless of sex, the new, recessionary reality is clear: If you want more, you're going to have to earn it. The hard way.

Surprisingly, people at the lower levels of the IS pecking order are in slightly better shape than their loftier peers. True, no job category is getting spectacular raises. But when raises do come, they are going to programmers and analysts, not honchos.

"Companies are putting their smart money where it belongs — at the professional ranks. They must go for longer-term retention of professionals rather than managers," says Roger O'Connor, a senior consultant at Edward Perlin Associates, Inc. in New York. "You have to keep those folks satisfied."

And because higher-ups make more, Mattix adds, it's tougher to get their raises signed off by penny-pinching corporate budgeters.

"It costs more to give me a 10% raise than it does to give a computer operator a 10% raise," Mattix explains. "So it's easier to get those types of salaries approved."

Enjoying modest rises were operating systems programmers, data center supervisors, programmers and database analysts (see chart).

In contrast, network and local-area network managers suffered the biggest declines, followed by IS and microcomputer managers and CIOs, vice presidents and directors of IS (see chart).

To keep employees happy and productive in stingy times, IS managers are trying a range of tactics.

Many are doing what they can to beef up corporate benefits (see story at right).

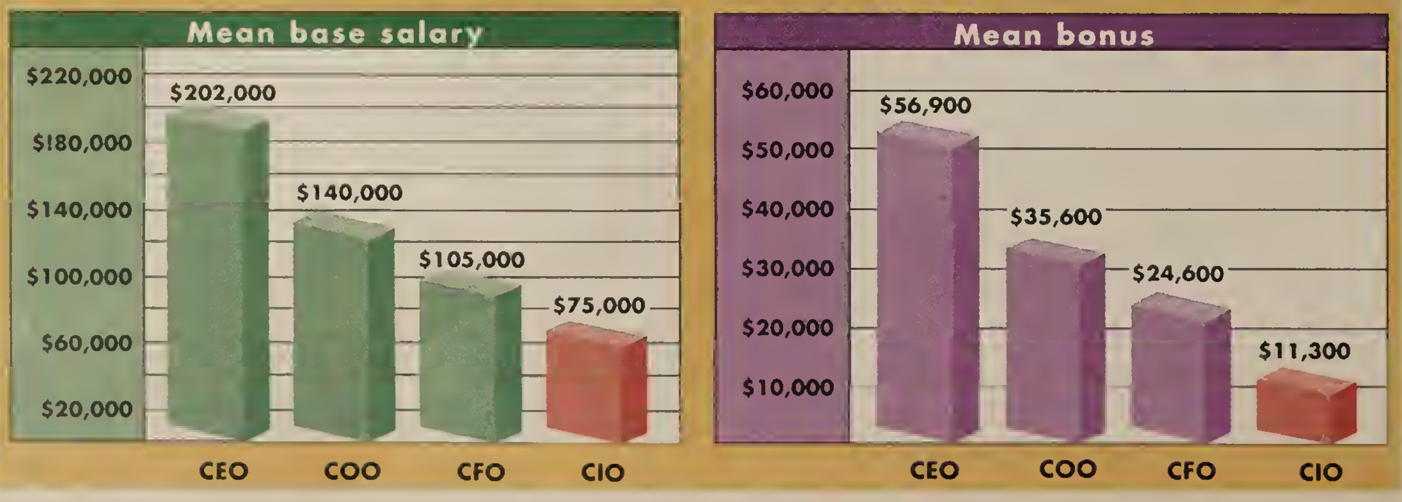
Some managers, such as Mattix, are willing to sacrifice their own raises for their staff. "I'm willing as a manager to take a lesser increase for

*Continued on page 89*

## 1992 SALARY SURVEY

### Pecking order

*Well-paid by IS standards, CIOs still earn 25% to 65% less than other top corporate officers*



Source: *CFO* magazine

# Not so fringe benefits

During times when money is so tight it can't talk, employers are trying to use benefits to sweeten IS compensation packages.

Nonfinancial incentives, says Roger O'Connor, a senior consultant at Edward Perlin Associates, "probably only came about as a result of the economy. Companies are saying, 'What else can we do other than compensation?' "

Overall, about 48% of IS workers surveyed by *Computerworld* now have the option of working flexible hours. Employee assistance and wellness programs are also popular.

Consultants also say that more senior IS executives are asking for a bridging or quicker vesting of pension and retirement funds.

While benefits in many large organizations may not be negotiable, placement specialists say they can still help decide whether a person takes an IS job.

David Raciti, vice president at Corico Recruiters in Salem, N.H., tells of a senior programmer/analyst who turned down a job offer because he would have had to pay $2,000 more in health insurance premiums.

Interestingly, IS professionals in different parts of the country want different perks.

In Atlanta, child care is much desired among IS workers surveyed. In the Pacific Northwest and San Francisco area, paid sabbaticals are hot. Bostonians like stock options.

Expectations can run pretty high. In New York, O'Connor says, IS executives often expect extras such as car phones, health club memberships, supplemental retirement and health plans, personal expense accounts and company cars or chauffeurs.

*Following is a summary of benefits that IS professionals surveyed now have:*

- *Vacation (98.8%).*
- *Health insurance (98.5%).*
- *Life insurance (92.9%).*
- *Dental insurance (82.6%).*
- *Retirement/Pensions (82.1%).*
- *Education (66.4%).*
- *Extended leave (41.4%).*
- *Profit-sharing/Stock options (37.4%).*
- *Expense account (34.1%).*
- *Bonus incentives (32.9%).*
- *Telecommuting (13.9%).*
- *Sabbaticals (10.2%).*
- *Child care (8.2%).*

KELLY E. DWYER

COMPUTERWORLD SALARY SURVEY 1992

# How are YOU DOING?

Average annual salaries for IS jobs

| MANAGEMENT | | END-USER SUPPORT | | | COMMUNICATIONS | | | | SYSTEMS AND PROGRAMMING | |
|---|---|---|---|---|---|---|---|---|---|---|
| CIO/VP/ IS Director | IS Mgr./ Supervisor | Micro Mgr. | Help Desk Operator | PC Specialist | Network Mgr./Admin. | LAN Mgr./Admin. | Telecom. Mgr. | Comm. Specialist | Systems & Progr. Mgr. | Project Mgr. |
| **Avg.:** $69,373<br>**Bonus:** $7,242<br>**Total:** $76,615<br>**Down:** 3.5% | **Avg.:** $56,024<br>**Bonus:** $3,903<br>**Total:** $59,927<br>**Down:** 4% | **Avg.:** $44,337<br>**Bonus:** $2,074<br>**Total:** $46,411<br>**Down:** 4% | **Avg.:** $29,824<br>**Bonus:** $1,049<br>**Total:** $30,873<br>**New** | **Avg.:** $31,945<br>**Bonus:** $1,050<br>**Total:** $32,995<br>**Down:** 1.7% | **Avg.:** $44,663<br>**Bonus:** $2,174<br>**Total:** $46,837<br>**Down:** 8.9% | **Avg.:** $38,957<br>**Bonus:** $1,561<br>**Total:** $40,518<br>**Down:** 6.4% | **Avg.:** $48,068<br>**Bonus:** $2,285<br>**Total:** $50,353<br>**Down:** 0.8% | **Avg.:** $37,458<br>**Bonus:** $1,223<br>**Total:** $38,681<br>**Down:** 2.3% | **Avg.:** $54,497<br>**Bonus:** $3,058<br>**Total:** $57,555<br>**Down:** 1.5% | **Avg.:** $50,794<br>**Bonus:** $2,142<br>**Total:** $52,936<br>**Down:** 1.6% |
| **INDUSTRY** | | | | | | | | | | |
| Utils. $86,229 | Finance $71,469 | Utils. $54,000 | Consult. $38,167 | Utils. $36,708 | Finance $53,077 | Utils. $46,625 | Consult. $55,333 | Consult. $46,500 | Consult. $64,250 | Consult. $60,400 |
| Computer $85,583 | Computer $68,000 | Finance $51,727 | Govt. $32,228 | Consult. $34,722 | Utils. $52,050 | Finance $43,083 | Banking $52,864 | Utils. $43,143 | Finance $61,800 | Media $59,333 |
| Consult. $83,278 | Utils. $67,417 | Insur. $46,500 | Finance $32,167 | Insur. $34,500 | Govt. $47,441 | Consult. $42,750 | Retail $51,667 | Banking $39,472 | Banking $61,200 | Nonprft. $56,500 |
| Finance $82,222 | Constr. $59,706 | Govt. $46,371 | Other $31,771 | Banking $34,244 | Banking $46,850 | Constr. $42,300 | Mfg. $49,919 | Govt. $39,348 | Utils. $59,844 | Utils. $54,864 |
| Banking $79,419 | Consult. $58,500 | Mfg. $45,507 | Utils. $30,833 | Govt. $33,230 | Retail $45,348 | Govt. $40,192 | Utils. $49,500 | Retail $38,438 | Media $59,000 | Banking $52,950 |
| Insur. $75,162 | Banking $58,242 | Banking $45,072 | Constr. $30,778 | Mfg. $32,995 | Mfg. $44,945 | Banking $39,950 | Computer $48,625 | Finance $38,000 | Insur. $57,017 | Mfg. $52,467 |
| Health $72,100 | Mfg. $56,991 | Consult. $44,500 | Banking $29,405 | Constr. $32,167 | Constr. $43,958 | Insur. $38,769 | Health $48,105 | Health $37,059 | Mfg. $55,948 | Constr. $51,333 |
| Constr. $72,000 | Govt. $56,533 | Other $43,409 | Mfg. $29,404 | Finance $31,556 | Health $43,146 | Other $38,200 | Other $48,100 | Media $37,000 | Constr. $55,536 | Insur. $49,975 |
| Mfg. $69,820 | Health $55,375 | Constr. $42,969 | Insur. $29,109 | Health $30,794 | Consult. $42,250 | Health $38,033 | Govt. $47,549 | Mfg. $36,722 | Govt. $53,444 | Health $49,857 |
| Retail $66,459 | Insur. $55,250 | Retail $42,452 | Computer $28,962 | Retail $30,537 | Insur. $41,500 | Media $38,000 | Constr. $46,214 | Computer $36,667 | Health $53,371 | Retail $49,707 |
| Media $65,000 | Retail $52,286 | Health $42,364 | Educ. $28,526 | Other $30,058 | Computer $40,667 | Retail $37,346 | Nonprft. $46,000 | Insur. $36,500 | Retail $52,639 | Computer $49,571 |
| Other $64,658 | Other $51,102 | Media $42,167 | Retail $28,485 | Computer $29,333 | Media $40,500 | Mfg. $37,238 | Finance $44,333 | Constr. $33,600 | Computer $51,500 | Govt. $49,378 |
| Govt. $64,637 | Media $50,400 | Computer $40,167 | Health $28,128 | Educ. $28,769 | Other $39,231 | Computer $37,100 | Insur. $41,929 | Other $32,700 | Other $50,174 | Other $48,679 |
| Educ. $61,183 | Educ. $48,881 | Educ. $38,798 | Media $25,833 | Nonprft. $26,563 | Educ. $38,800 | Educ. $35,556 | Educ. $40,765 | Educ. $30,000 | Educ. $48,273 | Finance $45,167 |
| Nonprft. $60,958 | Nonprft. $44,500 | Nonprft $34,400 | Nonprft $22,167 | Media $24,250 | Nonprft. $37,200 | Nonprft. $14,000 | Media NA | Nonprft. NA | Nonprft. $46,250 | Educ. $43,773 |
| **REGION** | | | | | | | | | | |
| N. Calif. $81,227 | N. Calif. $66,037 | N. Calif. $49,926 | N. Calif. $35,370 | S. Calif. $37,527 | N. Calif. $52,568 | Balt./D.C. $45,575 | Balt./D.C. $55,132 | Balt./D.C. $43,375 | Chicago $61,103 | S. Calif. $59,400 |
| S. Calif. $78,986 | Balt./D.C. $63,022 | S. Calif. $49,752 | Boston $34,773 | N. Calif. $36,217 | Other $51,000 | N. Calif. $41,068 | N. Calif. $53,464 | N.Y. $41,611 | N. Calif. $59,654 | Balt./D.C. $54,386 |
| N.Y. $75,570 | N.Y. $59,706 | Chicago $49,500 | N.Y. $33,853 | Boston $35,333 | Chicago $50,882 | Texas $40,533 | S. Calif. $52,125 | N. Calif. $41,190 | S. Calif. $59,500 | N.Y. $53,722 |
| Balt./D.C. $75,508 | S. Calif. $58,026 | Balt./D.C. $48,917 | S. Calif. $33,278 | N.Y. $33,370 | S. Calif. $50,462 | Atlanta $40,333 | N.Y. $51,100 | Chicago $41,179 | N.Y. $58,720 | Boston $52,889 |
| Boston $72,837 | Detroit $57,872 | N.Y. $48,125 | Detroit $31,425 | Detroit $33,167 | Atlanta $46,357 | S. Calif. $40,292 | Chicago $50,500 | S. Calif. $40,500 | Boston $56,804 | Chicago $52,682 |
| Chicago $72,486 | Texas $56,366 | Boston $45,824 | Chicago $30,413 | Balt./D.C. $32,764 | Balt./D.C. $46,897 | Chicago $39,893 | Ariz. $48,571 | Atlanta $40,143 | Balt./D.C. $56,037 | Texas $51,821 |
| Texas $69,296 | Boston $56,243 | Detroit $44,534 | Balt./D.C. $29,922 | Texas $31,970 | Texas $44,158 | N.Y. $39,222 | Fla. $48,067 | Detroit $39,923 | Minn. $54,456 | Fla. $51,118 |
| Minn. $68,385 | Chicago $56,128 | Texas $44,173 | Denver $29,542 | Minn. $31,071 | Boston $43,967 | Pacif. NW $38,375 | Detroit $47,857 | Minn. $38,333 | Atlanta $53,458 | N. Calif. $50,967 |
| Detroit $68,143 | Minn. $54,950 | Minn. $43,760 | Minn. $29,333 | Chicago $30,714 | Minn. $43,741 | Denver $37,806 | Boston $46,333 | Denver $36,324 | Detroit $52,868 | Atlanta $50,219 |
| Other $67,875 | Denver $54,327 | Atlanta $42,458 | Atlanta $29,288 | Ariz. $30,700 | Denver $42,182 | Boston $37,071 | Atlanta $46,222 | Boston $34,643 | Texas $52,529 | Detroit $48,882 |
| Atlanta $65,730 | Ariz. $52,305 | Pacif. NW $40,794 | Texas $28,926 | Denver $30,650 | Pacif. NW $41,312 | Detroit $37,000 | Minn. $46,118 | Pacif. NW $33,379 | Denver $52,167 | Denver $48,857 |
| Denver $63,660 | Atlanta $52,100 | Ariz. $40,104 | Pacif. NW $28,054 | Pacif. NW $30,264 | Ariz. $40,775 | Ariz. $35,929 | Denver $44,553 | Ariz. $32,925 | Ariz. $50,609 | Minn. $47,978 |
| Ariz. $62,980 | Pacif. NW $49,282 | Denver $39,978 | Ariz. $26,733 | Atlanta $30,125 | Detroit $40,324 | Minn. $35,735 | Texas $43,000 | Fla. $31,952 | Pacif. NW $49,488 | Ariz. $46,840 |
| Fla. $62,706 | Fla. $48,635 | Fla. $36,235 | Fla. $25,472 | Fla. $26,560 | N.Y. $39,778 | Fla. $33,656 | Pacif. NW $42,500 | Texas $30,600 | Fla. $49,387 | Pacif. NW $45,879 |
| Pacif. NW $59,214 | Other $47,500 | Other $37,000 | Other $24,500 | Other $25,883 | Fla. $39,740 | Other $25,000 | Other $34,500 | Other $30,333 | Other $41,500 | Other $35,667 |
| **COMPANY SIZE** | | | | | | | | | | |
| **Under $50M:** $58,023<br>**$50M - $499M:** $72,238<br>**$500M and up:** $94,138 | **Under $50M:** $48,881<br>**$50M - $499M:** $55,948<br>**$500M and up:** $68,198 | **Under $50M:** $38,025<br>**$50M - $499M:** $43,476<br>**$500M and up:** $52,494 | **Under $50M:** $27,121<br>**$50M - $499M:** $29,437<br>**$500M and up:** $32,455 | **Under $50M:** $28,258<br>**$50M - $499M:** $32,100<br>**$500M and up:** $36,205 | **Under $50M:** $39,433<br>**$50M - $499M:** $44,427<br>**$500M and up:** $50,579 | **Under $50M:** $34,927<br>**$50M - $499M:** $38,413<br>**$500M and up:** $42,948 | **Under $50M:** $42,587<br>**$50M - $499M:** $46,833<br>**$500M and up:** $52,948 | **Under $50M:** $30,894<br>**$50M - $499M:** $36,368<br>**$500M and up:** $41,590 | **Under $50M:** $48,859<br>**$50M - $499M:** $54,512<br>**$500M and up:** $61,118 | **Under $50M:** $49,000<br>**$50M - $499M:** $49,704<br>**$500M and up:** $54,859 |

## NOTES

**Survey size:** Charts based on 1,478 responses.

**Industries:** Banking category includes securities and investment banking. Retail includes wholesale. Construction includes mining, petroleum, refining and agriculture. Computer includes related hardware, software and service fields. Nonprofit includes amusement firms.

**Locations:** Texas includes Dallas, Fort Worth and Houston. Florida includes Miami, Tampa and Orlando. Southern California includes Los Angeles and San Diego. Minnesota includes Minneapolis and St. Paul. Northern California includes San Francisco and the Oakland Bay area. Arizona includes Phoenix and Tucson. Pacific Northwest includes Seattle; Portsmouth, Wash.; and Spokane, Wash.

**NA:** Not available.

| SYSTEMS AND PROGRAMMING | | | | | | | SERVICES AND OPERATIONS | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sr. Systems Analyst | Systems Analyst | Sr. Progr./ Analyst | Progr./ Analyst | Senior Progr. | Progr. | Security Admin./Anal. | Tech. Svcs. Mgr. | Sr. Op. Sys. Progr. | Op. Systems Progr. | Data Ctr. Op. Mgr. |
| **Avg.:** $45,913<br>**Bonus:** $1,600<br>**Total:** $47,513<br>**Up:** 0.6% | **Avg.:** $40,186<br>**Bonus:** $1,282<br>**Total:** $41,468<br>**Up:** 2% | **Avg.:** $41,613<br>**Bonus:** $1,335<br>**Total:** $42,948<br>**Down:** 1.5% | **Avg.:** $34,942<br>**Bonus:** $1,199<br>**Total:** $36,141<br>**Up:** 1.1% | **Avg.:** $37,372<br>**Bonus:** $875<br>**Total:** $38,247<br>**Up:** 2.6% | **Avg.:** $29,474<br>**Bonus:** $890<br>**Total:** $30,364<br>**Up:** 2.5% | **Avg.:** $39,964<br>**Bonus:** $1,411<br>**Total:** $41,375<br>**New** | **Avg.:** $54,549<br>**Bonus:** $3,234<br>**Total:** $57,783<br>**No change** | **Avg.:** $49,278<br>**Bonus:** $1,824<br>**Total:** $51,102<br>**Down:** 0.3% | **Avg.:** $41,891<br>**Bonus:** $1,342<br>**Total:** $43,233<br>**Up:** 5% | **Avg.:** $43,911<br>**Bonus:** $2,008<br>**Total:** $45,919<br>**Down:** 1.1% |
| **INDUSTRY** | | | | | | | | | | |
| Consult. $50,214 | Consult. $45,800 | Utils $44,958 | Utils $40,029 | Nonprft. $48,000 | Utils $33,708 | Constr. $45,667 | Banking $65,700 | Consult. $63,000 | Consult. $53,000 | Utils. $54,962 |
| Finance $49,500 | Banking $44,773 | Finance $44,727 | Computer $37,700 | Utils $41,083 | Consult $32,667 | Govt $44,207 | Utils. $63,778 | Other $60,333 | Other $48,333 | Banking $48,540 |
| Banking $48,821 | Utils. $43,300 | Computer $43,944 | Consult. $37,600 | Govt. $39,750 | Computer $32,083 | Insur $42,250 | Consult $61,167 | Computer $53,857 | Utils $46,750 | Finance $45,591 |
| Utils. $48,143 | Constr. $42,727 | Mfg. $42,848 | Constr. $36,200 | Other $39,083 | Govt. $30,895 | Finance $42,250 | Computer $60,833 | Finance $52,600 | Govt. $45,115 | Mfg. $45,247 |
| Constr. $47,133 | Retail $40,800 | Govt. $42,103 | Mfg. $35,777 | Retail $39,067 | Constr. $30,792 | Retail $41,100 | Finance $56,500 | Utils. $51,611 | Retail $42,441 | Consult. $44,333 |
| Computer $46,125 | Finance $40,650 | Banking $41,981 | Banking $35,771 | Mfg. $38,109 | Finance $30,333 | Utils. $40,583 | Insur. $56,107 | Retail $49,929 | Computer $42,167 | Govt. $43,973 |
| Govt. $45,971 | Govt. $40,134 | Constr. $41,971 | Govt. $35,455 | Health $36,313 | Other $30,077 | Consult. $38,000 | Health $55,521 | Insur. $49,778 | Finance $41,750 | Insur. $42,932 |
| Mfg. $45,931 | Educ. $39,955 | Retail $41,684 | Health $34,666 | Computer $36,000 | Retail $29,189 | Mfg. $37,058 | Retail $54,810 | Banking $49,286 | Mfg. $41,703 | Health $42,557 |
| Health $45,417 | Mfg. $39,893 | Other $41,229 | Insur. $34,367 | Consult. $36,000 | Health $29,174 | Computer $37,000 | Mfg. $54,370 | Mfg. $49,112 | Banking $41,312 | Computer $42,038 |
| Other $44,727 | Nonprft. $39,500 | Insur. $40,833 | Retail $34,309 | Constr. $34,714 | Mfg. $28,856 | Health $36,750 | Govt. $52,731 | Govt. $49,011 | Health $41,278 | Educ. $41,943 |
| Retail $44,615 | Media $39,000 | Consult. $40,000 | Educ. $32,898 | Finance $34,000 | Banking $28,600 | Banking $36,083 | Constr. $50,429 | Health $48,200 | Insur. $41,222 | Retail $41,538 |
| Insur. $44,059 | Health $38,283 | Health $39,937 | Media $32,875 | Banking $33,958 | Nonprft. $27,500 | Other $33,000 | Other $49,455 | Educ. $44,133 | Nonprft. $39,000 | Constr. $40,731 |
| Educ. $43,886 | Computer $37,200 | Educ $36,889 | Finance $32,567 | Educ. $33,143 | Insur. $27,250 | Educ. $29,875 | Educ. $48,825 | Nonprft. $40,000 | Educ. $35,500 | Other $39,969 |
| Media $43,417 | Insur $37,143 | Nonprft. $35,571 | Other $32,543 | Insur. $30,800 | Educ $26,200 | Nonprft. NA | Media $37,000 | Constr. $34,500 | Media $35,000 | Nonprft. $39,500 |
| Nonprft. $42,500 | Other $36,667 | Media $34,937 | Nonprft. $31,179 | Media $28,000 | Media $19,000 | Media NA | Nonprft. $30,000 | Media NA | Constr. $27,667 | Media $39,100 |
| **REGION** | | | | | | | | | | |
| S. Calif. $51,320 | N. Calif. $45,308 | N. Calif. $47,484 | N. Calif. $41,172 | N. Calif. $46,714 | N. Calif. $36,233 | N. Calif. $47,375 | Boston $62,818 | N. Calif. $55,889 | N. Calif. $45,722 | N.Y. $48,722 |
| N. Calif. $49,370 | S. Calif. $43,810 | S. Calif. $45,682 | S. Calif. $38,393 | S. Calif. $41,900 | S. Calif. $34,579 | S. Calif. $46,333 | Chicago $60,711 | Balt./D.C. $55,184 | Boston $45,643 | Chicago $47,611 |
| N.Y. $49,036 | Balt./D.C. $43,735 | Balt./D.C. $43,446 | N.Y. $38,263 | N.Y. $41,000 | Boston $31,625 | Detroit $45,800 | N. Calif. $60,636 | S. Calif. $54,000 | Balt./D.C. $45,633 | N. Calif. $46,845 |
| Balt./D.C. $48,684 | N.Y. $43,583 | Chicago $42,194 | Chicago $36,154 | Balt./D.C. $40,719 | Balt./D.C. $30,571 | Minn. $44,545 | S. Calif. $58,912 | Boston $50,600 | Chicago $44,222 | Balt./D.C. $46,469 |
| Texas $47,429 | Chicago $42,861 | Denver $42,061 | Balt./D.C. $36,128 | Chicago $38,375 | N.Y. $30,542 | Balt./D.C. $44,071 | N.Y. $58,857 | Detroit $49,679 | Detroit $43,083 | Boston $46,275 |
| Boston $45,568 | Atlanta $42,125 | N.Y. $42,043 | Texas $34,756 | Minn. $37,385 | Texas $30,326 | Atlanta $42,000 | Balt./D.C. $56,907 | Atlanta $48,417 | S. Calif. $42,125 | S. Calif. $46,232 |
| Chicago $45,479 | Fla. $40,750 | Texas $41,909 | Boston $34,704 | Boston $36,125 | Chicago $29,795 | N.Y. $41,100 | Minn. $53,857 | Minn. $48,385 | Pacif. NW $42,107 | Minn. $42,776 |
| Atlanta $45,370 | Texas $40,500 | Atlanta $41,080 | Atlanta $34,589 | Ariz. $36,000 | Minn. $29,191 | Denver $40,313 | Texas $52,667 | Fla. $48,321 | Minn. $41,531 | Denver $42,773 |
| Detroit $44,786 | Detroit $39,583 | Pacif. NW $40,243 | Detroit $33,957 | Detroit $35,679 | Pacif. NW $28,829 | Texas $39,875 | Ariz. $52,441 | N.Y. $47,625 | N.Y. $41,500 | Detroit $42,288 |
| Minn. $44,773 | Boston $39,219 | Minn. $39,705 | Denver $33,741 | Denver $35,562 | Detroit $28,571 | Boston $37,750 | Fla. $52,113 | Chicago $47,400 | Texas $40,458 | Texas $41,980 |
| Denver $44,469 | Minn. $38,121 | Boston $39,620 | Pacif. NW $33,647 | Pacif. NW $35,036 | Atlanta $28,222 | Chicago $37,143 | Denver $51,974 | Denver $47,250 | Denver $40,250 | Ariz. $41,906 |
| Fla. $44,429 | Pacif. NW $37,909 | Detroit $39,479 | Minn. $33,245 | Texas $34,250 | Denver $28,043 | Fla. $35,938 | Detroit $51,714 | Texas $46,556 | Ariz. $40,150 | Pacif. NW $41,881 |
| Pacif. NW $42,887 | Denver $37,900 | Ariz. $39,455 | Ariz. $33,086 | Fla. $33,682 | Fla. $26,560 | Pacif. NW $32,800 | Atlanta $50,794 | Pacif. NW $46,167 | Atlanta $40,038 | Atlanta $41,593 |
| Ariz. $42,385 | Ariz. $37,625 | Fla. $37,973 | Fla. $32,583 | Atlanta $31,455 | Ariz. $25,980 | Ariz. $31,950 | Pacif. NW $48,796 | Ariz. $46,059 | Fla. $39,300 | Fla. $41,172 |
| Other $32,000 | Other $25,333 | Other $18,500 | Other $22,000 | Other $17,000 | Other $16,000 | Other $23,667 | Other $39,667 | Other $41,000 | Other $25,500 | Other $33,667 |
| **COMPANY SIZE** | | | | | | | | | | |
| Under $50M: $43,100<br>$50M - $499M: $45,462<br>$500M and up: $48,510 | Under $50M: $37,309<br>$50M - $499M: $39,600<br>$500M and up: $43,352 | Under $50M: $39,535<br>$50M - $499M: $41,533<br>$500M and up: $44,596 | Under $50M: $32,713<br>$50M - $499M: $35,090<br>$500M and up: $37,802 | Under $50M: $33,971<br>$50M - $499M: $36,118<br>$500M and up: $39,436 | Under $50M: $27,678<br>$50M - $499M: $29,508<br>$500M and up: $32,118 | Under $50M: $29,714<br>$50M - $499M: $37,379<br>$500M and up: $43,991 | Under $50M: $49,571<br>$50M - $499M: $53,291<br>$500M and up: $61,014 | Under $50M: $43,150<br>$50M - $499M: $50,156<br>$500M and up: $50,766 | Under $50M: $35,550<br>$50M - $499M: $42,611<br>$500M and up: $42,709 | Under $50M: $38,993<br>$50M - $499M: $42,794<br>$500M and up: $50,676 |

# 'I should be making WHAT?'

You've just learned that you're making $5,000 less than a friend with essentially the same job.

Do you a) Quit and go to work at his company? b) Ask for a $5,000 raise? c) Look for work at a company that will pay you what you're worth? or d) Keep quiet and be thankful you've got a job?

None of these is the right answer, according to IS recruiters.

Instead, they say, do some homework and look beyond a simple comparison of salaries before making a move.

Jim Parker, a senior MIS recruiter at Technical Connections, Inc. in Los Angeles, suggests a strategy of six steps:

**1) Prepare your case.** A good first step is to gather performance reviews and list your major accomplishments.

**2) Meet with the boss.** Next, arrange an informal session with your supervisor and ask for feedback.

**3) Reconsider if necessary.** If that feedback is negative, Parker says, you'll need to reassess whether you're truly underpaid.

**4) Make the pitch.** If the feedback is positive, tell the boss: "Here's a concern that I have." (Make it your problem, not the boss'.) "In talking to people both internally and externally, I've learned that I'm probably underpaid by about $3,000 or $4,000. What do you think?" This puts the ball in your boss' court.

**5) Form a plan.** The two of you should then figure out what's needed to raise your pay to the desired level.

**6) If that fails, look around.** "If there's no meeting of the minds, then you've got to start looking outside," Parker advises.

# The buck stops here

CONTINUED FROM PAGE 86

Nubar Alexanian

**Rhode Island General Assembly's Hackett:** *'I'm critical of [women] that work for me that don't demand more and that haven't sought management positions'*

myself and, if I can, pass that on to some of the people underneath me and allow them to get a little more," he says.

In some cases, though, stronger measures are needed. Some companies are simply cutting out raises altogether. The number of companies reporting "no salary increases" in the 1992 survey jumped from 8.1% to 11.1% this year.

A few organizations are even taking deep, if temporary, salary reductions. State workers across Rhode Island, including IS, took a 14% pay cut in 1991, according to Hackett.

The cut in salary was restored in 1992, Hackett says, meaning that employees will receive deferred compensation when they retire or leave the government. But he says the short-term effect clearly was painful.

### Big firms, big pay

Predictably, IS personnel in large companies and big metropolitan areas earned more than their cousins in smaller settings.

For example, CIOs at companies with annual revenues exceeding $500 million earned an average of $106,825. In contrast, the top technology officer at firms with sales of less than $50 million averaged $61,000.

Geographically, pay in high-priced areas such as Northern and Southern California, New York and Boston outpaced locales where the cost of living is cheaper.

But pay in all regions slumped in 1992. Florida was especially hard hit: Averages for IS managers in the Sunshine State plummeted from $60,170 last year to $48,635 in this year's survey.

No doubt, many IS people would have hoped for more upbeat salary news, even in a recession. Yet not everyone appears upset. Some are thankful just to have jobs.

Others, like Glenn Shubert, a systems programmer at Our Lady of the Lake Regional Medical Center in Baton Rouge, La., say money isn't a top priority. "I'm happy doing what I'm doing and happy with what I'm making," he says.

Another possible reason for satisfaction, Stevens Van Lines' Biskner says, is that many IS people simply don't know what their peers make.

"I've found the people who work for me are very out of touch with how much other people in their same job classifications are making," Biskner says. "They have a tendency to say what they think they'd like to make but have nothing to justify that. And I think that's sad — people should know what they're worth. They don't even attempt to find out."

If there's an upside, it's that stubborn, recession-rising unemployment has made it a bit easier to fill IS middle-management jobs.

Consider: Last year it took 56 days to fill a midlevel IS slot. In 1991, it took 51 days. Time needed to fill top posts actually increased from 72 to 78 days, however. Entry-level searches remained at 32 days.

### Cloudy future

As for the future, nobody is making upbeat predictions.

True, traditional IS jobs, such as operating systems programmer and data center shift supervisor, are enjoying a minor upturn in pay. But that's most likely due to the new interest in recentralizing some technology functions, and it probably won't last. So long-term optimism is hardly rampant.

"The revolution in distributed technology is still relatively young," placement specialist Gaines says. "There's a tremendous risk that rank-and-file IS professionals who have come of age in the mainframe environment may find themselves obsolete, with relatively little prospects for compensation growth."

Current changes in industry and technology, he adds forebodingly, "put the conventional IS person at serious risk."

On a brighter note, some are hopeful that the male/female salary gap in IS can be closed, or at least narrowed.

"It's a slow growth," Jackson sighs. "Once again, it's a matter of us proving ourselves in an industry that's male-dominated and showing our worth."

If and when that occurs, women will discover that, for the foreseeable future, the pickings will still seem slim. •

*Senior editor Joseph Maglitta contributed to this report.*

| SERVICES AND OPERATIONS | | | | DATABASE GROUP | | | |
|---|---|---|---|---|---|---|---|
| Data Ctr. Shift Sup. | | Computer Operator | | Database Mgr./Admin. | | Database Analyst | |
| **Avg.:** $32,773<br>**Bonus:** $1,113<br>**Total:** $33,886<br>**Up:** 4% | | **Avg.:** $24,229<br>**Bonus:** $894<br>**Total:** $25,123<br>**New** | | **Avg.:** $49,965<br>**Bonus:** $1,925<br>**Total:** $51,890<br>**Down:** 1.8% | | **Avg.:** $43,473<br>**Bonus:** $1,523<br>**Total:** $44,996<br>**Up:** 2.6% | |
| **INDUSTRY** | | | | | | | |
| Utils. | $43,222 | Consult. | $28,667 | Consult. | $62,500 | Computer | $60,000 |
| Consult. | $40,000 | Utils. | $28,600 | Utils. | $58,400 | Consult. | $50,500 |
| Other | $36,000 | Govt. | $28,045 | Finance | $54,667 | Constr. | $50,333 |
| Finance | $35,143 | Finance | $25,263 | Constr. | $53,167 | Finance | $50,000 |
| Mfg. | $34,944 | Computer | $24,154 | Retail | $51,310 | Utils. | $49,600 |
| Govt. | $33,445 | Mfg. | $24,105 | Banking | $50,200 | Banking | $47,625 |
| Computer | $32,500 | Insur. | $23,782 | Mfg. | $50,020 | Other | $45,550 |
| Banking | $32,405 | Educ. | $23,517 | Health | $49,083 | Govt. | $44,267 |
| Educ. | $32,147 | Other | $23,457 | Insur. | $48,773 | Mfg. | $43,739 |
| Insur. | $32,125 | Media | $23,346 | Govt. | $48,590 | Insur. | $41,429 |
| Retail | $30,161 | Constr. | $22,913 | Other | $48,571 | Educ. | $40,250 |
| Health | $28,433 | Retail | $22,792 | Educ. | $48,471 | Retail | $39,050 |
| Constr. | $25,833 | Banking | $22,512 | Computer | $46,937 | Health | $35,789 |
| Media | $24,000 | Health | $21,680 | Nonprft. | $38,000 | Nonprft. | NA |
| Nonprft. | NA | Nonprft. | $21,433 | Media | $31,333 | Media | NA |
| **REGION** | | | | | | | |
| N. Calif. | $38,962 | Boston | $33,833 | Boston | $57,750 | S. Calif. | $50,800 |
| S. Calif. | $35,625 | N. Calif. | $28,030 | Texas | $56,682 | Boston | $50,250 |
| N.Y. | $35,250 | N.Y. | $27,012 | Chicago | $54,000 | Balt./D.C. | $48,923 |
| Balt./D.C. | $34,120 | S. Calif. | $26,613 | N.Y. | $52,938 | Texas | $47,500 |
| Texas | $33,625 | Detroit | $25,136 | N. Calif. | $52,341 | N. Calif. | $45,071 |
| Chicago | $33,469 | Balt./D.C. | $24,865 | Balt./D.C. | $52,000 | Minn. | $44,091 |
| Ariz. | $33,219 | Chicago | $23,698 | Ariz. | $50,737 | Ariz. | $43,750 |
| Detroit | $32,654 | Minn. | $23,269 | Minn. | $50,594 | Fla. | $43,500 |
| Boston | $32,571 | Pacif. NW | $23,038 | Atlanta | $50,038 | Pacif. NW | $42,964 |
| Denver | $31,955 | Atlanta | $22,649 | S. Calif. | $49,545 | Atlanta | $42,045 |
| Pacif. NW | $31,381 | Texas | $22,509 | Detroit | $46,592 | Chicago | $40,292 |
| Atlanta | $31,233 | Denver | $22,145 | Denver | $45,750 | Detroit | $40,071 |
| Minn. | $29,937 | Ariz. | $21,968 | Fla. | $45,125 | Denver | $37,538 |
| Fla. | $28,050 | Fla. | $20,654 | Pacif. NW | $44,273 | N.Y. | $33,333 |
| Other | $18,667 | Other | $16,000 | Other | $25,000 | Other | $30,500 |
| **COMPANY SIZE** | | | | | | | |
| Under $50M: $29,531<br>$50M - $499M: $31,121<br>$500M and up: $36,801 | | Under $50M: $21,773<br>$50M - $499M: $25,041<br>$500M and up: $25,959 | | Under $50M: $41,220<br>$50M - $499M: $49,823<br>$500M and up: $56,419 | | Under $50M: $38,412<br>$50M - $499M: $43,043<br>$500M and up: $44,911 | |

## METHODOLOGY

*Computerworld*'s sixth annual salary survey includes responses from 1,478 information systems professionals polled by IDG Research Services in Framingham, Mass.

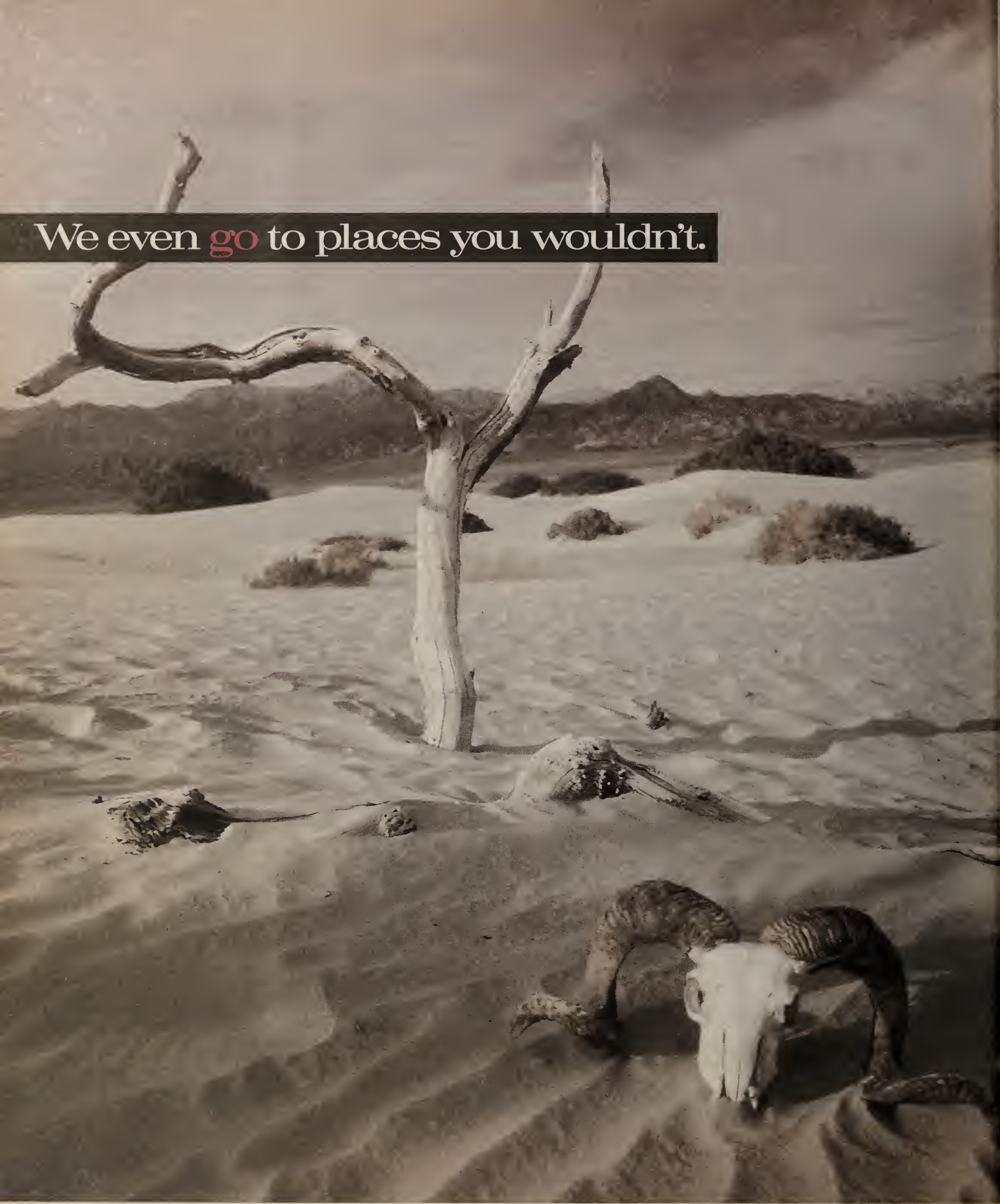
Surveys were mailed on June 10 to approximately 9,000 people. Unduplicated names were culled from lists provided by The Association for Systems Management, The Applied Computer Research directory, *Computerworld*'s circulation department, *Computerworld*'s Buyers' Database and the 1991 *Computerworld Premier 100.*

Twenty-three job titles in 15 industries and 14 geographic regions were included.

**Sex:** Male: 1,197; Female: 281.

**Age:** Under 25: 0.9%; 25-34: 20.1%; 35-44: 38.9%; 45-54: 31.4%; 55-64: 8.25%; 65 or older: 0.2%.

**Company size:** Annual revenue under $1M: 2.7%; $1M-$9.9M: 10.6%; $10M-$49M: 23.7%; $50M-$99M: 16.4%; $100M-$249M: 12.5%; $250M-$499M: 8.3%; $500M-$999M: 5.3%; $1B-$4.9B: 7.1%; $5B-$10B: 1.9%; more than $10B: $2.8%; Other: 8.8%.



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# The information integrator

*BP Australasia has one. So does PacifiCare. Internal integration staff go external people one better — they know a company's culture and systems*

BY FRANCES M. BRUCE

There's a powerful allure to the idea of hiring an outsider to tie together the mishmash of systems that have grown up in your organization over time. But there are some good reasons why a company might want to resist the urge and cultivate its own information integration specialists.

We've done this at British Petroleum Australasia Ltd., establishing the internal function of information integrator. In fact, that's my own job title.

Key responsibilities of this position, which is part of the information systems department, include figuring where and how systems can best be deployed to optimize business processes and get data to the people who need it. This involves targeting technologies that can ease communication across organizational boundaries and provide access to data held in several different databases. It also involves coordinating in-house and external experts to turn the plan for integrated systems into reality.

Of course, external integrators can do these things, too, but the difference is that internal integrators have an insider's knowledge of the organization, its culture and its existing resources. To gather the appropriate information, external integrators must rely on extensive interviews, which take time and might not give an accurate view of the company's technology palette.

A person working from the inside knows who the real "influencers" are in an organization and where to go to get speedy cooperation for a project or buy-in from users. He also knows where information resides and which other systems the company has developed that could be reused and integrated into the new scheme.

At British Petroleum, for example, a business unit wanted an information report management system. Instead of buying new software, I extended an existing report management system, using existing communications software, at a cost of $3,500. A new package would have cost $23,000.

This is not to say that there is no role for third parties. Outside experts can be a great help in implementing integration plans, and one of the internal integrator's tasks is to coordinate this kind of assistance with internal resources. The idea is to buy help but cultivate strategic integrators.

What you gain with an information integrator is a strong and well-rooted leader to give users quick and accurate access to the full range of the organization's information resources. Typically, someone in this position reports to the chief information officer and acts as a consultant on all projects related to making systems work together.

An information integrator reviews existing processes and work practices and suggests changes to them, if necessary. He places emphasis on binding separate organizational processes and practices more closely together and always takes into account the human impact of change.

This is no lightweight post. It takes considerable expertise in both technology and personal dynamics. While an internal integrator acts as an overseer, rather than a hands-on technician, someone in this job still needs to be well-versed in data analysis, applications development and networking in the context of international open systems standards.

The information integrator must also play the part of facilitator on projects, using knowledge of organizational dynamics and human relations to overcome political barriers, break down resistance to change and devise integration strategies that will improve, rather

*Continued on page 92*

Darius Detwiler

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Bruce is an information integrator at British Petroleum Australasia Ltd. She has degrees in sociology, education and computing.

- Buy help but cultivate internal integrators
- A blend of technologist, sociologist
- PacifiCare's Leo Collins tells it like it is

# PacifiCare's integrator in residence

BY LORY ZOTTOLA DIX

What's a research psychologist doing in a place like PacifiCare Health Systems, Inc., a $1.2 billion health maintenance organization? If you guessed practicing medicine, try again. Leo Collins is applying his psychology and technical training to manage a 20-person team of senior technologists assigned to assist systems integration efforts.

"We're acting as consultants and integrators" for internal development groups, says Collins, whose title is director of computer and communications technology. He reports to PacifiCare's CIO.

PacifiCare's December 1991 merger with Health Plan of America, Inc. created a combined Digital Equipment Corp. and Hewlett-Packard Co. shop. The 40-year-old Collins and his team deal with the systems development staff, diagnosing requirements and then finding the appropriate technologies to answer particular needs.

Recently, for example, Collins met with the developer working on an integrated voice response system. The task was to figure out how to provide direct transparent access to a central database for geographically scattered physicians seeking information on how much to charge patients based on their particular plan.

These physicians had been obtaining the data by using one of roughly a dozen 800 numbers to call customer service representatives. Collins and the developer wanted to ensure that far-flung doctors had to dial only one number to get that information from a central database, using customer service reps only if needed.

"We sat down and worked out a plan to configure and integrate the voice response box with the customer service system and phone system," Collins says. The developer went back with plan in hand; the system should be live now.

Collins' team of technologists includes experts in networks, systems programming, databases, transaction processing and desktop integration. Narrow specialization is not encouraged, however. Collins uses job rotation to ensure that members of the group are well-versed in a variety of technical areas. For example, the person in charge of systems programming was previously development manager.

For his part, Collins claims to be a "generalist" with a background in networks, systems and databases. "I've got my fingers in every pie," he says. And what of the time he spent as a research psychologist at an institution for family development? "I know a lot about negative and positive reinforcement from my days of watching rats press levers. Psychological theories have given me great insight into dealing with people," he says.

Collins prides himself on the fact that he's a bit hard to reach by phone. "I'm always walking around the campus talking to people," he says. That's how he came across the situation that prompted one of his group's most recent projects: networking stand-alone PC telemarketing data with demographic data residing on a DEC VAX.

Collins doesn't just look internally for information. He's constantly on the watch for information about other companies with similar systems requirements. He also works with outside consultants, overseeing external service providers in the information systems area.

Dix is *Computerworld*'s senior editor, in depth.

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*Continued from page 91*

than impede, communications flows and process productivity.

I'd recommend at least eight years of relevant experience in both technical and people-related posts as a requisite for this job. I have 16 years of experience and a sociology background, which I've found is every bit as important as my technical training.

### Variety key

Diversity is the watchword of the information integrator's skill set because he is dealing with a hodgepodge of information and business groups. It's best, in fact, for a candidate to have worked in both other fields and other companies.

An ideal candidate is someone who has a humanities background (I have degrees in both sociology and teaching), has worked in the services field, has moved into computing and has gained expertise by working at several companies and on several projects.

Once that person has joined a company and worked there for a minimum of four years in IS, rotating jobs and marinating in company culture, he would move into his integrator role, consulting with various project teams to get things rolling.

## Hidden talents

Internal information integrators already exist in a number of U.S. companies, but they are not always easy to find or count, says M. Victor Janulaitis, president of Santa Monica, Calif.-based Positive Support Review, Inc. and publisher of the *Handi-Guide for Information Systems Position Descriptions*. In the U.S., Janulaitis says, the stress is on function, not title, and in many instances, the function of integrator is performed as part of a larger job or several people's jobs.

The official titles for these jobs will vary from company to company, with perhaps the most frequently used tag being vice president of consulting services. At PacifiCare Health Systems, Inc., Leo Collins performs the integration function under the title of director of computer and communications technology (see story above).

Whether a single, full-time integrator is really the best answer for a particular company depends on a number of factors, according to Janulaitis. In smaller companies, it might be difficult to justify a full-time position only to handle this integration, whereas in very large, complex organizations, a single person probably couldn't handle everything that needs to be done.

It is essential that the information integrator has credibility — an essence created by significant achievements in other organizations — combined with acceptance and influence at his current company.

His specific "soft" skills and technical prowess should include the following:

- **Creativity and vision, with the ability to help develop a systems strategy.** The CIO charged with cultivating an integrator among his staffers must ask himself, "Who operates at a strategic, conceptual level?"
- **Strong project management and leadership ability.** These skills will enable the internal integrator to coordinate the diverse range of multidisciplinary resources needed for achieving integrated systems.
- **Political skills.** He should be knowledgeable about the organization, its culture and its processes, either from his own experience or from the experiences of other key people. He needs to know who the "influencers" of company policy are and who can help get commitment on a project.
- **The ability to gain the confidence of a diverse set of users.** The integrator's work spans business units. In fact, he may often have to pacify and educate users who are jealously hoarding data. This kind of territorial resistance can stymie efforts to provide ready access to information from different databases and to integrate data, systems and computer processing/network levels.

I've found that the best way to nip user problems in the bud is to involve users and managers in the integration process. This way the integrator fosters a broad level of ownership and support for the strategy. These feelings may even contribute to better organizational cohesion.

- **Ability to understand user requirements.** The information integrator bridges the gap between a user's information needs and an organization's sources of information and its delivery frameworks. Therefore, before he integrates anything, he must first establish what users' needs are — what data they must access to do their jobs and with what business functions they want to interact.

That involves talking to users and business managers not only about the information they need and where it resides but also about how processes help or hinder their work.

- **Ability to work with those business colleagues who are setting business process redesign goals.** An internal integrator cannot be expected to be highly expert in all areas of the business as well as the technology. Rather, he should be good at working closely with those business managers who want to change the way they do business.

An information integration function harnesses technology to support business changes.

The idea here is to couple the technologist/sociologist with the businessman (or business integrator, if you will) who has a sound understanding of the various business streams within the company.

- **Applications development experience, including strong expertise in data analysis.** At the level at which the information integrator works, there is no hands-on data analysis.

However, a good understanding of data's timeliness and integrity and its importance as a corporate resource enriches his ability to make the right integration moves for a company.

For example, I am versed in data management and information warehouse concepts, which helped when I needed a plan for combining and storing some British Petroleum data that came from physically separate personal computers.

- **Strong information architecture skills.** The integrator needs to think in terms of frameworks — how a change in one part of the company could affect what happens to systems and business in another. He must have some grand plan for information.

Because the integrator is a trailblazer, he provides input to the corporate architecture group to create new standards for the rest of the company.

- **Computer communications, with practical network experience covering both data and voice communications and implementation of Open Systems Interconnect standards.** Without sufficient depth of knowledge in networking, the integrator cannot effectively envision a plan to link information in the best way for the business.

Knowledge of open standards is also important so that the company will be able to integrate its different areas without fussing too long over specific vendor equipment.

The integrator should ask questions such as: What will we gain in flexibility and what kind of return on investment can we expect from Transmission Control Protocol/Internet Protocol? Which standard should the company use for external electronic data interchange?

Not all of the above are easy skills to assess, but there's one requirement that, while fuzzy, is even more essential than those just listed: the ability to have a sense of the future in dealing with the present.

This is critical because the goal of this job is to develop a strategy that anticipates needs, drawing together relevant sections of the company's current application, data and technology resources to produce a sustaining answer to business needs. •

THE CEO VIEW

# Anchors aweigh!

*CEO sets company sails for re-engineering shores after rescuing it from fiscal storm*

BY NELL MARGOLIS
CW STAFF

One day in 1989, only months after James M. Large Jr. was brought into Anchor Bancorp, Inc. to apply his noted turnaround talents to the bank's bleeding balance sheet, an accounting requirement contained in the newly passed Financial Institutions Reform, Recovery and Enforcement Act hurled Anchor into insolvency between breakfast and dinner.

Industry observers expected Anchor to bite the dust; instead, Large bit the bullet. Within two years, he reduced the bank's work force of about 3,260 by some 30%, sold off a string of noncore subsidiaries, consolidated branches and tightened procedures, slashing overall expenses by an estimated 25%.

This past April, Anchor signed an extensive outsourcing/technology co-development pact with Systematics Information Services, Inc. (see story page 95). On June 30, after reversing prior losses, returning the corporation to profitability and adding $300 million to capital, the bank was released from the regulatory restrictions under which it had been operating since April 1990.

Historically, this would be Large's cue to light out for the territories — but this time, the "Turnaround Man" says he's planning to stay.

Now heading beyond reconstruction into the early stages of a largely uncharted re-engineering initiative, "Anchor is a unique opportunity for all of us," Large says. Even as regulators loomed and colleagues lost their jobs, he says, "It's incredible how much enthusiasm there is here; everyone pitched in to make this [turnaround] happen. We didn't work this hard to win this place back just to walk away."

In a recent interview with Nell Margolis, *Computerworld*'s senior editor, management, Large expanded on where and how he plans to cast Anchor and on information technology's role in the effort.

Bob Sasha

**The CEO:** *James M. Large Jr.,60; graduate of Princeton University and the Stonier School of Banking at Rutgers University.*

**The career:** *Came to Anchor in 1989 from First Interstate Bancorp, where he served as executive vice president and assistant to the president of the $56 billion bank holding company (1986-89). Prior to that, held executive positions at First National Bank of Allentown (1981-86), Central National Bank of Cleveland and Central Pennsylvania National Bank.*

### ■ On the re-engineering initiative under way at Anchor:

We're not a long way into re-engineering yet — and that's appropriate because we see it as a continuing process rather than a project with a beginning, middle and end.

Back in '89, we were hit so hard, so fast, that we went to work in all the usual ways — and some otherwise — to get our earnings up. Interestingly, we were able to do this while improving the quality of our service — although we've certainly still got room for improvement.

We've been whacking away at these problems steadily over the past three years, and we've gone further than most people thought we ever could.

But the good news stops right there: We've done all we can without seriously altering the way in which we perceive ourselves and go about our everyday business. Now we're running out of steam; to get a second wind, we're going to have to figure out what we should be doing, and can do, differently. Whether we can make this next transition as smoothly as we've made our last one remains to be seen.

### ■ On the role of information technology:

We have a wonderful reputation as a customer-friendly bank, and we talk a very good game. During the next year, our major thrust is putting into our employees' hands whatever tools are necessary to make sure that in every last detail, we're playing as good a game as we talk. Right now, we're turning our technology folks loose to try to figure out how.

Since information is the backbone of everything that goes on at a bank, it's a sure bet that information technology will play a major role. But we have to be careful about what role. At this early stage, we're taking a couple of steps to help ensure that the [technology] tail doesn't wag the dog.

First, we're going to slice the [banking] organization along functional lines: Job definitions will be pegged to the kind of results that ought to be accomplished and the various tasks people really do to accomplish those ends, rather than geared to titles and established procedures.

Then we're going to add some systems improvement people to our IS forces — not to enhance the computer systems themselves, but to reconfigure the way we're working and target places where technology can be a valuable tool. And in doing this, one important idea we'll be bearing in mind is that, in a given instance, less or older or even no technology might be the answer.

### ■ On outsourcing:

When we thought about outsourcing, a couple of things were important to us. First, cost structure: What we had gotten on our own was an ability to freeze cost over time, but that wasn't the home run we were looking for. We wanted to roll cost back.

Second, an IS boost — a chance to co-develop with a partner who's way ahead of us.

Some folks assume you outsource to divorce your organization from IS: That's nonsense — we don't want to get out of these things; we want to get further into them. They're the core of what we do as bankers. Data processing, IS, the whole area of [banking] product development — this is what drives and produces the capabilities we deliver to end users.

Anchor doesn't feel that it's appropriate for us to spend our resources on being state of the art; our responsibility is to be aware of the state of the art and to cherry-pick it for the things that will benefit us.

### ■ On the meaning of customer service in banking:

Expense reduction and service improvement are inextricably related. I'm a total believer that no matter what you're good at in banking — and this includes information technology — you'd better be a whale of a low-cost operation.

You'd also better be ready to back up the warm, friendly personal feeling people like to get at the bank with the ability to actually do what the customer wants and needs to have done.

The moment of truth comes when the customer comes face-to-face with the bank. When a customer is walking up to Mrs. Jones, the teller, that's the

*Continued on page 95*

**INSIDE**

▶ Intelligence files — items of interest from publications, speeches, research projects. Page 95.

▶ Calendar. Page 94.

## CALENDAR

### SEPT. 20-26

**Sapphire '92.** Orlando, Fla., Sept. 20-23 — Contact: Sylvia Bauer, SAP Canada, North York, Ontario. (416) 229-0574.

**Pen-Based Expo.** Los Angeles, Sept. 21-23 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

**Virtual Reality '92.** Westport, Conn., Sept. 23-25 — Contact: Meckler Conference Management, Westport, Conn. (203) 226-6967.

**Business & Computer Solutions '92.** Seattle, Sept. 24-25 — Contact: Vikki Samata-Thomas, Data Processing Management Association, Bothell, Wash. (206) 485-0794.

### SEPT. 27-OCT. 3

**The Sixth Annual Strategic Issues Conference and Client Forum.** La Jolla, Calif., Sept. 29 — Contact: Computer Intelligence, Santa Clara, Calif. (408) 980-4300.

**CASE World Conference & Exhibition.** Boston, Sept. 30-Oct. 2 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

**CD-ROM Expo '92.** Boston, Sept. 30-Oct. 2 — Contact: Mitch Hall Associates, Dedham, Mass. (617) 361-2001.

**Software Publishers Association (SPA) Annual Conference.** Washington, D.C., Sept. 30-Oct. 3 — Contact: SPA, Washington, D.C. (202) 452-1600.

**Graph Expo East '92.** New York, Oct. 3-6 — Contact: Graphic Arts Show Co., Reston, Va. (703) 264-7200.

### OCT. 4-10

**The New Tools for Design and Design Production Conference.** New York, Oct. 4-6 — Contact: The Center for Computer Graphics for Design, Santa Fe, N.M. (505) 986-0523.

**Repository AD/Cycle International Users Group Conference.** Chicago, Oct. 4-7 — Contact: Repository AD/Cycle Group, Santa Monica, Calif. (310) 394-8305.

**Electronic Data Interchange Association (EDIA) Annual Conference.** Nashville, Oct. 5-8 — Contact: Gregory Harter or William Myers, EDIA, Alexandria, Va. (703) 838-8042.

**Scan-Tech '92.** Anaheim, Calif., Oct. 5-8 — Contact: AIM USA, Pittsburgh, Pa. (412) 963-8588.

### OCT. 11-17

**Networld '92.** Dallas, Oct. 13-15 — Contact: Kathy Ryan, Networld, Fort Lee, N.J. (201) 346-1400.

### OCT. 18-24

**Info/Tech Management '92.** Nashville, Oct. 18-21 — Contact: Data Processing Management Association, Park Ridge, Ill. (708) 825-8124.

**Riscon '92 Conference and Exhibition.** New Orleans, Oct. 18-21 — Contact: National Retail Federation Division, New York, N.Y. (212) 244-8780.

**Society of Information Management (SIM) 1992 Annual Conference.** Universal City, Calif., Oct. 18-21 — Contact: SIM, Chicago, Ill. (800) 477-4561.

**APICS Conference and Exhibition.** Montreal, Oct. 18-23 — Contact: The Educational Society for Resource Management, Falls Church, Va. (703) 237-8344.

**International Society for Hybrid Microelectronics '92.** San Francisco, Oct. 19-22 — Contact: Terry Ritter, San Jose, Calif. (408) 945-9992.

### OCT. 25-31

**The 13th Annual Treasury Management Conference.** San Diego, Oct. 25-28 — Contact: Treasury Management Association, Baltimore, Md. (301) 907-2862.

**ASIS Annual Meeting.** Pittsburgh, Oct. 26-29 — Contact: Richard B. Hill, ASIS, Silver Spring, Md. (301) 495-0900.

**Total Quality Management '92 Conference and Exhibits.** Chicago, Oct. 27-28 — Contact: Pat Jones, Society of Manufacturing Engineers, Dearborn, Mich. (313) 271-1500.

**Outsourcing the Help Desk Conference.** Colorado Springs, Oct. 27-30 — Contact: Help Desk Institute, Colorado Springs, Colo. (719) 531-5138.

**Educom '92.** Baltimore, Oct. 28-31 — Contact: National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

**Expo Comm China.** Beijing, Oct. 30-Nov. 4 — Contact: Wendy Pang, E. J. Krause Associates, Hong Kong. (011) 5-773-343.

### NOV. 8-14

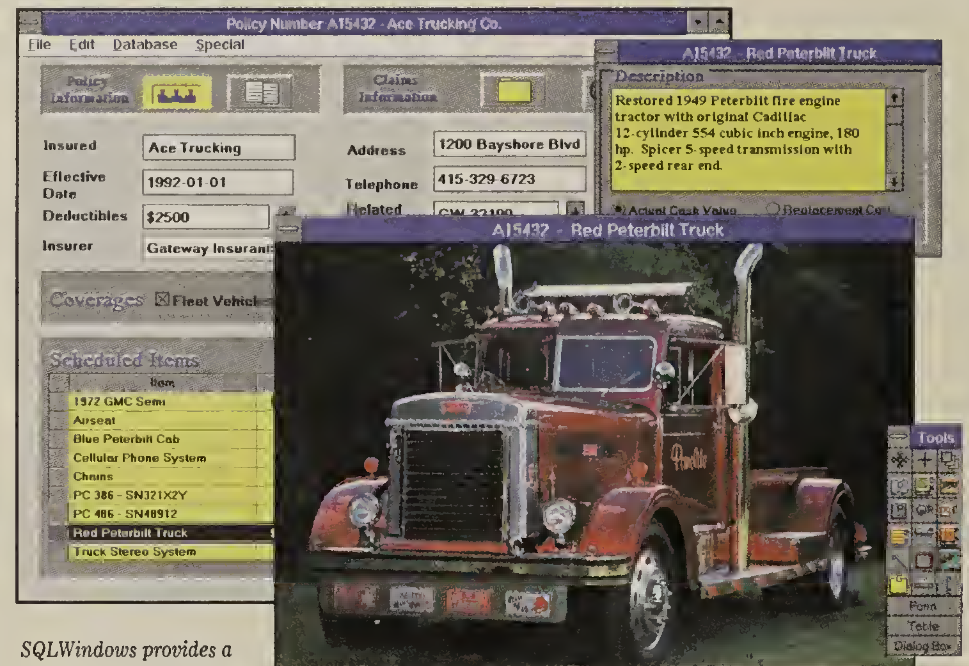
**U.S. Society of Wang Users (USSWU).** Boston, Nov. 9-13 — Contact: USSWU, Chicago, Ill. (708) 652-3888.

**12th Annual Eastern American NCR/AT&T Computer Users Conference.** Lake Harmony, Pa., Nov. 12-13 — Contact: Frank Whalon, Tinius Olsen Testing Machine Co. (215) 675-7104, Ext. 216.

**Synergy '92.** Anaheim, Calif. Nov. 9-13 — Contact: Weingarten Publications, Inc., Boston, Mass. (617) 542-0146

### NOV. 15-21

**International Security Systems Symposium and Exhibition.** Washington, D.C., Nov. 16-18 — Contact: Krause & Associates, Bethesda, Md. (301) 986-7800.



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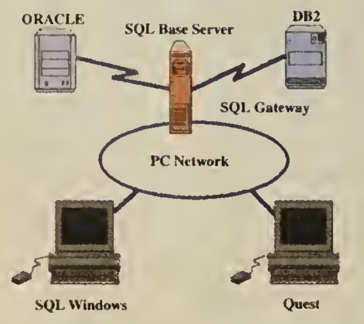

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## INTELLIGENCE FILES

*Items of interest from publications, speeches, surveys and research projects*

### Assembly of integrators

■ ParaTechnology, Inc. in Bellevue, Wash., has published a guide to more than 200 systems and network integrators to help information systems managers in their searches for service providers. The guide offers detailed information on each company and can be used to cross-reference a range of technical skills and services, vendor relationships, vertical market expertise, company revenue and major contracts.

The 450-page directory is available in print for $495 and on disk for $995.

Source: *A systematic guide to systems integrators,* BusinessWeek, *Sept. 7, 1992.*

### Thrifts spend for PCs

■ Banks and thrifts are rapidly replacing their branch offices' dumb terminals with personal computers, and the thrift industry is leading the way. In 1992, 55% of banks and 64% of thrifts are expected to install PCs at teller stations.

Meanwhile, merger fever in the banking industry has produced huge multibank holding companies that are technology-buying powerhouses. The top 1% of the banking industry will spend $1.7 billion on information technology in 1992 — more than 60% of the information technology budget for the whole industry.

Source: *"Annual Financial Industry Systems and Technology Survey," Mentis Corp., Salisbury, Md., July 28, 1992.*

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### Poll fax?

■ Some federal and state election administrators are pushing legislation that would allow U.S. citizens overseas to submit their voter registrations and absentee ballots electronically.

Supporters say voting by fax or electronic mail would boost absentee voting so much that it could make a difference in the outcome of some close elections.

Source: *"Election officials back fax balloting proposal," by Richard G. Smolka, "Election Administration Reports," Aug. 3, 1992.*

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### Boosting worker performance

■ Chief information officers may soon be hearing about an emerging scientific discipline called human performance technology (HPT), which finds ways to make people more productive in the workplace.

HPT's roots are in the field of instructional technology, but HPT also draws on research in management science, IS and human factors engineering.

Generally, work performance can be improved by the application of training, job aids and feedback systems. Information technologies such as Help systems, computer-aided instruction and expert systems can play important, performance-enhancing roles.

Source: Handbook of Human Performance Technology, *edited by Harold D. Stolovitch and Erica J. Keeps; published by Jossey-Bass, Inc., 1992.*

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### Getting out of outsourcing deals

■ An outsourcing contract is like a marriage — easy to get into and a nightmare when it comes to divorce. Consequently, it is crucial for the contract to include termination procedures that provide a smooth transition from the outsourcing vendor to another vendor or back to the customer.

For example, the customer or new vendor must have the right to continue using existing software and documentation and perhaps even the right to hire some key personnel — the people who know the customer's systems.

One of the trickiest parts of the outsourcing divorce is dividing the hardware, especially if the vendor is using it to service multiple customers. On the other hand, if the hardware was acquired solely for one customer, the vendor may try to force that customer to buy it or share in the financial loss from selling it to a third party.

Source: Scott on Computer Law (Second Edition), *by Michael D. Scott; published by Prentice Hall, 1992.*

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*Compiled by Kelly E. Dwyer, assistant editor, features, with contributions from Mitch Betts, national correspondent.*

# CEO backs re-engineering

CONTINUED FROM PAGE 93

second at which whatever the IS department, or human resources, or legal or accounting or what have you done to empower Mrs. Jones to help that customer either succeed or fail. And if Mrs. Jones is standing there with a software program she doesn't know how to use, or doesn't like to use, or that takes a long time to work, or that would have been working except that there's a glitch somewhere on the network, then she's falling down on the job the minute she opens her mouth.

And it doesn't matter one iota that this is the swiftest, latest cutting-edge technology; it's failing.

■ **On the barriers to creating a service-oriented bank:**

There's no question about it: Culture is the hardest part. People build little boxes around themselves, defined by their jobs as they saw them when they first took them on, and it can be extremely hard to get them to see outside the box.

If a job is seen as "I push X button" or "I do Y on Mainframe Z" rather than "I push this button or use this mainframe because at this point in time, that's the best way for me to give customers what they want and need," it's a pretty difficult thing to get the [jobholder] to switch gears and work back from the result to the process: "My job is to help the bank help the customer; is pushing the button or using the mainframe the most effective way to do that?"

■ **On surmounting those habit barriers:**

One of the things we're doing to try to break down these cultural roadblocks is, simply, talking a lot. It's an important part of my job that I'm going to spend a specific amount of time just walking the place, telling the story — not just among managers, but in the mailroom, with the gardeners: Customer service is also whether the lawn is cut. . . .

Much more fun and effective than sitting around a conference table at yet another meeting is going out into the departments and the branches, talking to people, getting their ideas as well as telling them some of mine.

By 1989, for instance, this bank had become pretty encrusted with policies: X gets done Y way. We enlisted branch people to make suggestions about which policies to kill — and then we implemented a lot of the better suggestions.

Of course, we had our law department look to make sure we hadn't just thrown out [regulatory] compliance! But why should a teller have to go to an assistant teller to get a signed authorization to access a piece of information which used to be in a locked file somewhere but now is readily accessible on-line?

Something else a little bit unusual that we're doing to communicate: The bank's corporate strategy is mailed to each of our tellers.

They may be dismayed rather than delighted to get 20 pages of print to go through — but they are included in the loop and don't have to pick up a newspaper or even a company bulletin to find out what their own bank is doing and why.

■ **On the CEO's duty to understand technology:**

I don't believe the widely held view that a generalist can run a business is valid. It's a popular philosophy, I know, but company after company makes this miraculous discovery: If you understand the details of the business and what it entails, you're better at running it.

So no, from that point of view, I'm not a technologist and don't think it would be in the bank's best interests if I were. To be ignorant of it or scornful or afraid would be just as bad. I'd say "well-informed" and "wide open to the possibilities. . . ."

■ **On the changing role of the CIO:**

One of our strengths is that Joel [Talka, Anchor's executive vice president and head of IS] has been here for so many years and is ideally able to take the lead in making a lot of people who are not technologically literate into completely comfortable users of technology. It's another plus to have so experienced a [CIO] to head up the outsourcing partnership.

Does that mean that when these efforts succeed, he'll have worked himself out of a job? If you're looking at a job as a box — the rigid, process-oriented rather than results-oriented kind of thinking that we all have to break out of — I can see where that could be a concern for a CIO. Otherwise, not.

Joel starts from a base of technology, but that's not the whole ballgame. He's a member of our management committee. He could easily step in and run branches. He can't work himself out of his job — he's a banker."

## Anchored in reality

When Anchor Bank outsourced to Systematics last April, Joel Talka, executive vice president and effective CIO, was not crowded out; to the contrary, he was bumped up. "We're very lucky that Joel is first a banker, then a businessman, and then knows everything there is to know about information systems," says Anchor Chairman/CEO James M. Large Jr.

Talka's "total job here at Anchor is perhaps an odd combination," says Large, who describes his relationship with his CIO as open, frank and symbiotic. "He's in charge of managing the outsourcing partnership. He's also in charge of leveraging that partnership and Systematics' technology to make us a more effective, better bank."

Large says he is relying on Talka to be a major spearhead and technological guide as the bank, which has already moved from recovery to restructuring, now attempts to step beyond both into re-engineering.

There are three general earmarks of a healthy IS environment, Talka says. "First, there is function: Whatever you provide to users has to be operating smoothly. Then, there's position: We never want to be six months behind what some business person wants." Third, he adds, is research depth. "We've been good on the first two, but not so good on three," he admits. Making up the research deficit, he says, "is a big part of what we want out of the outsourcing relationship."

Exactly how to harness technology to take the bank where it needs to go is being thrashed out, Talka says. Too many conclusions up front, he adds, would be a a warning sign of technology in the driver's seat, with business practices chugging along in its wake. That is the situation Anchor is trying to avoid.

Bob Sacha

**Anchor's Talka** *wasn't pushed aside when the outsourcers moved in*

# COMPUTER CAREERS

## IS pros know what they want

*Fantasies abound, but when reality hits, goals are set on management*

BY LESLIE GOFF
SPECIAL TO CW

What kinds of jobs do you fantasize about? If you are anything like the information systems professionals questioned by *Computerworld* about career aspirations, you're likely dreaming of careers that range from corporate fitness director to college professor.

But when those we interviewed come off the dream cloud, many reveal that what they'd really like to do is become managers — even vice presidents — someday.

Many IS professionals say they'll stick with IS for the technical challenge and to become more involved in technology leadership and decision-making.

**Keenan** *seeks database administration*

"I'd like to be evaluating new technologies relative to computers — multimedia, open systems, tools that allow systems to talk across multiple platforms, connectivity," says 15-year IS veteran Sidney Haggins, an information services analyst at Consolidated Diesel Co., a manufacturer of diesel engines based in Whitakers, N.C.

Haggins' ideal title 10 years from now would be vice president of networking, but he'd settle for a consulting position. He got involved in end-user computing about three years ago, after a six-year stint as an operations support analyst in Consolidated's data processing department. He now supports its personal computer networks.

**Humphrey** *hopes to get into AI*

Like Haggins, most want variety in their jobs but would like to obtain master's degrees and find opportunities at their current firms.

Fred Humphrey, an MVS systems programmer at Northrop Corp. in Los Angeles with 10 years of IS experience, takes classes at the University of California at Los Angeles (UCLA) to help him keep up to date on changes in the MVS world. He may also augment his bachelor's degree in computer technology with a UCLA certificate in programming by completing 10 three-hour courses.

Humphrey says he is ultimately interested in getting a master's degree and entering the field of artificial intelligence, but in the meantime, he'd like to become a project manager in a technical services or MVS programming group.

"I like the aspect of the technical part — data processing — better than applications," he says. "Originally, I came from applications development. I like systems programming better because of the technical aspects of how things work and why."

The target for Larry Keenan is database administration. Keenan, a systems analyst in the IS group at Southwestern Bell in St. Louis, is interested in DB2. He's keeping an eye open for strategic opportunities in his company and would like to get into system design rather than actual coding.

"It's a matter of requesting job assignments that would give me the technical skills I need," he says. "There's a certain amount of negotiating to get those appointments, but I could do it quite feasibly. Southwestern Bell is fairly good at moving people around, but you still have to do a certain amount of politicking — finding the right openings and the right people to invite you into them and getting high enough performance ratings."

Keenan, who says he is happy in telecommunications, echoed many IS professionals in saying he is satisfied working in his current industry segment. "The same things would apply across the board, regardless of the industry," Haggins notes.

All of these IS professionals hope that their earning power will increase during the next decade. Most hope for increases of $10,000 to $15,000 from salary levels that now range from $40,000 to $50,000.

### Satisfaction #1

More important to their long-range goals, however, was job satisfaction. It ranked as the IS professional's first priority in determining career goals from among the other categories of lifestyle, geography, money and title.

Take Kristi Kilpatrick. While she's currently on a solid career track as a systems analyst at Alexander Hamilton Life Insurance Company of America in Farmington Hills, Mich., she says her dream job would be in the consumer products industry. That's because of the satisfaction she'd get from participating in the creation of a tangible product.

"When you physically manufacture a product for the consumer, the whole process from operations to marketing is very intensive," she says.

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Goff is a New York-based free-lance writer.

## Land of promise

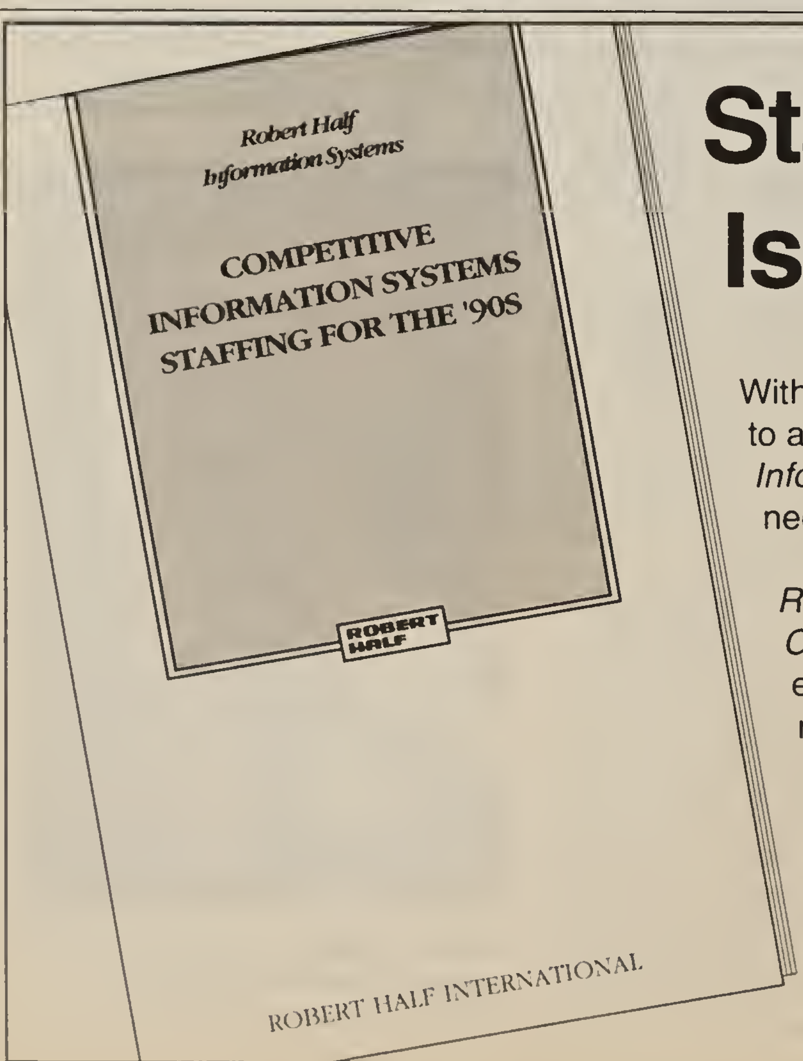
Matt Gambill, a software engineer at Woodbridge, Va.-based Universal Dynamics Corp., a maker of auxiliary equipment for the plastics industry, has worked here and in England. He says prospects for job satisfaction and job advancement are better on this side of the pond.

Ideally, he'd like the title of project manager and would love to get into the aerospace industry because of his affinity for space and mathematics. His primary concern is job satisfaction and feeling that he is making a contribution.

He says he was dissatisfied working in England, for instance, because "education wasn't important for IS positions — I had replaced a bricklayer who had had a modicum of experience.

"They see IS as more vocational than mission critical," he adds. "I want to feel that what I'm doing is important."

LESLIE GOFF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INDUSTRY CURRENTS

# Demand steady for IS jobs in discounting

BY SUZANNE WEIXEL
SPECIAL TO CW

Discount operations are the brightest lights in retailing right now, and these companies, locked in fierce competition, are investing heavily in information systems improvements and advanced technology to squeeze more profit out of smaller margins.

So far this hasn't produced a boom in IS jobs, but demand in this sector has held steady, and available jobs are by and large richer and more challenging.

"Scanning, mark-down processing, inventory replenishment and employee scheduling are all applications that can improve employee productivity. Improved employee productivity leads to an improved bottom line," says George Gillen, executive vice president at Management Horizons, a consulting division of Price Waterhouse that specializes in the retail industry.

When companies hire, they look for a certain amount of experience.

"If they can't hit the ground running, we can't afford the time for training," says Christopher Gay, vice president of information services at One-Price Clothing, Inc., based in Duncan, S.C.

Information technologies are abundant at every level, from the in-store systems used to manage inventory to the central systems used for buyer support.

Consistently, discount retailers look for a minimum of three years of IS experience and a four-year college degree.

Required experience seems to vary: Kmart Corp. used to run numerous training sessions for recent college graduates, according to Ronald L. Griffin, a senior systems manager responsible for store systems development at the Troy, Mich-based firm. Now, most hiring is done from within.

Wal-Mart Stores, Inc. considers seven to eight years of IS experience to be about right, according to Bobby Martin, executive vice president of information services at the Bentonville, Ark.-based chain.

Gay looks for four years of programming experience, but he also looks for "'creative-type" undergraduate degrees. "Art majors bring something extra to the job," he says. An MBA doesn't hurt, he adds, but it's not enough on its own.

"It's the technology that you bring to the table that gets you the job," says Elizabeth Roney, senior director of IS at Kmart's Fashion Division in North Bergen, N.J., who oversees mainframe-based central systems.

Roney says she sees a need for individuals who can combine an understanding of the business requirements with a creative approach to current technologies. Programming is giving way to computer-aided software engineering (CASE) tools and data manipulation, she explains.

Gay also looks for creativity and flexibility as well as an understanding of the job processes.

More important than the ability to read a technical specification and write an application is the ability to control the accuracy and efficiency of the data. Relational database management, specifically experience with DB2, is an important skill to hone, she says.

## New breed

"The batch programmer is dead," Roney says. "Now we need information engineers." In addition to experience with CASE and DB2, Roney looks for candidates who know fourth-generation programming languages (4GL) and understand how to implement automated development cycles.

Griffin says his programmers play a more traditional role. When good CASE tools are available on personal computers, there will be less need for technical language skills and more emphasis on analytical abilities, he says. But for now, what he's looking for is hands-on acquaintance with DOS and Unix and the ability to program in C or Informix Corp.'s 4GL.

Rapid growth, which some discounters are experiencing, also leads to somewhat different skill requirements. One-Price Clothing has grown from 150 stores to more than 400 stores in two years. Gay estimates that the company upgrades its IBM Application System/400-based systems every six months.

From the store level up, the systems people need to understand how everything from bar-code scanners to inventory control systems simplifies and speeds up the job processes, he says. They need skills in systems analysis, capacity planning and distribution processing. "PC literacy is vital," he adds, because PCs are proliferating in both the stores and in operations.

Gay also looks for experience with nonstandard programming tools such as CASE. "We don't have time to wait for a programmer to write a program," he says. "We need to be able to manipulate a database."

Martin agrees that the rapid development of systems and applications is the key to remaining competitive in the discount arena. He also says upper level management expects more from IS personnel than ever before.

"There's no room for people with a strictly technical viewpoint anymore," Martin says.

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Weixel is a free-lance writer based in Marlboro, Mass.

## Outlook: Discount retail

**WHERE THE JOBS ARE:** Opportunities exist throughout the country, although the Midwest seems to be the strongest.

**SALARIES:** Systems analysts with three to five years' experience can earn anywhere from $35,000 to $45,000. A special skill base can up that ante by another $10,000.

**HOTTEST JOB TITLES:** The hottest job titles now include business analysts and data managers. And as the industry emphasis shifts from programming to data management, some companies are coining new job titles. Kmart's Fashion Division recently retitled all of its programmer/analysts "information engineers."

**HOT TECHNICAL SKILLS:** The future is brightest for those who have experience with CASE tools, DB2, 4GLs, client/server technologies, electronic data interchange, PC-to-mainframe communications, expert systems and artificial intelligence.

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| Non-CPU Computer Products Manufacturer | 34,311 |
| VAR/Dealer/Retailer | 44,773 |
| DP Service Bureau/ Contract DP Services | 52,375 |
| Consulting/Planning | 112,149 |
| Manufacturer (not computers) | 229,608 |
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| Business Service (except DP) | 35,940 |
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| Public Utilities | 43,687 |
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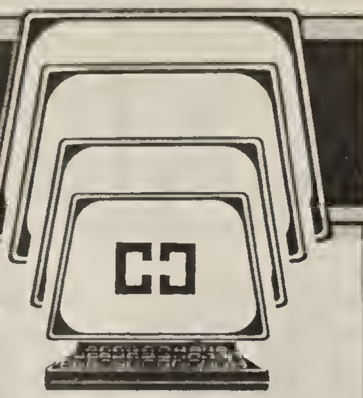

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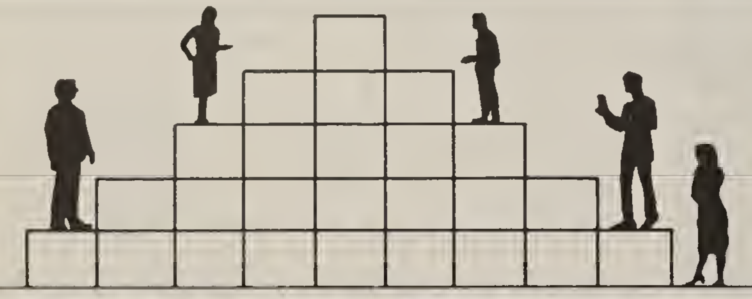

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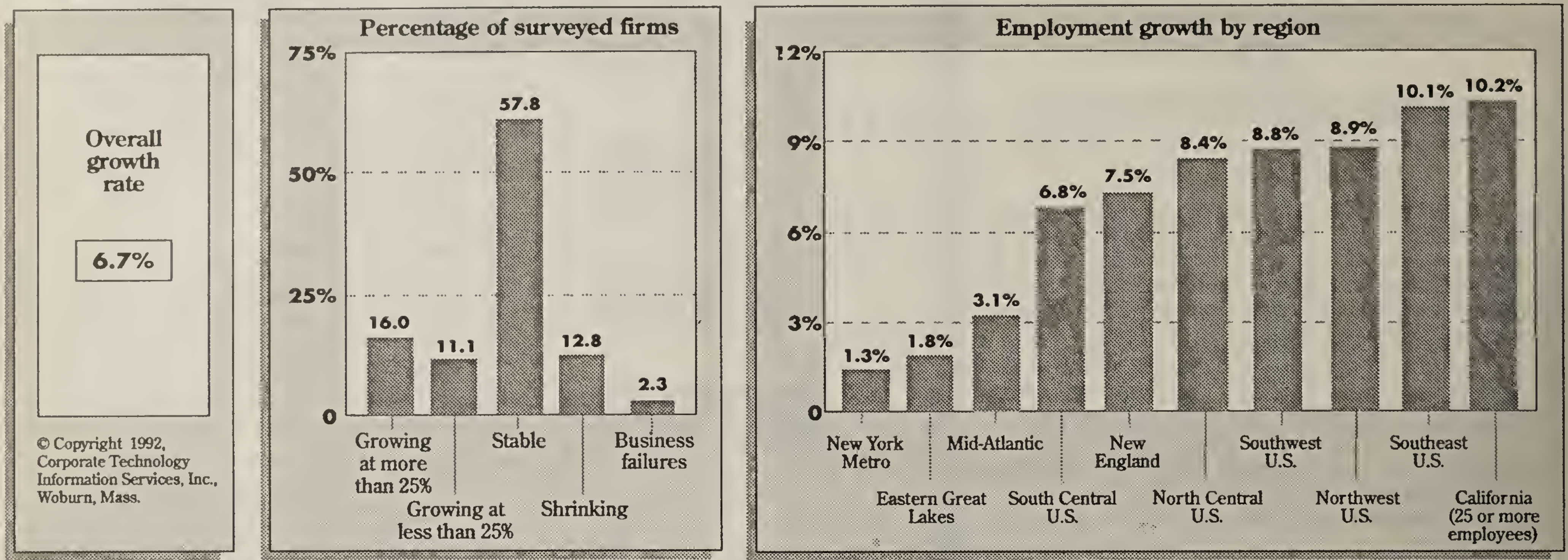

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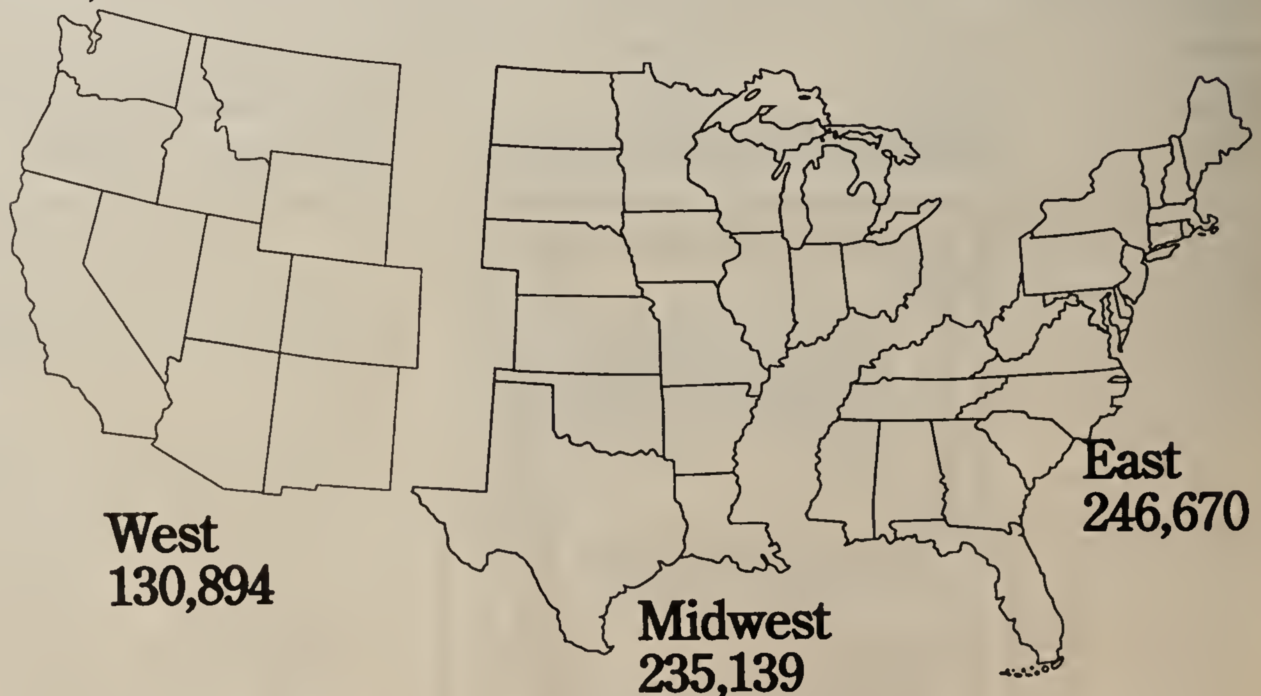

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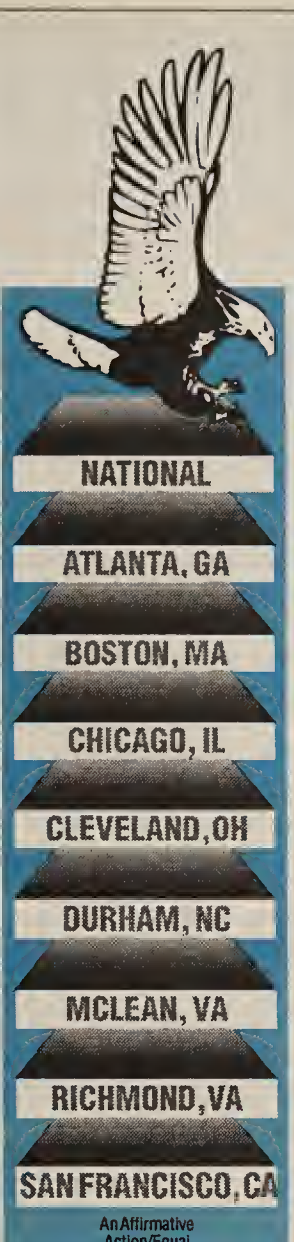

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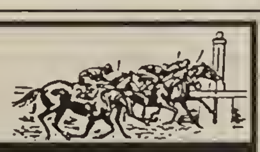

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# MARKETPLACE

## Batteries, cables not included

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There is something magical about opening a package. Even when you know what's inside, there's always the possibility of surprise. Unfortunately, the surprise isn't always pleasant. Like a shiny, new battery-powered toy without the batteries, the new purchase may lack something essential.

For instance, the package may lack cables. "All printers come without cables, but with monitors you get one," says Cindy Gabriel, senior end-user computing analyst at DeKalb Genetics Corp. in DeKalb, Ill. "You just have to know what comes with the product and what doesn't."

It's not that vendors are always out to deceive; more often, it's a case of inconsistent packaging. But regardless of the reason, it is annoying and sometimes embarrassing, too.

In one instance, after recommending a certain modem for a client, Sandra Eichler, a partner at Long Island-based New York Computer Consulting, discovered it couldn't be hooked up because it didn't come with cables — not a disaster, but an inconvenience. "It comes down to my mistake, but I would have assumed cables were included," she said.

### Where's the cable?

Palmtops also often come without the cables necessary for transferring data to and from personal computers, says Judy Brown, president of the Association of PC User Groups (APCUG) in Washington, D.C. "With the Hewlett-Packard 95LX, for example, you can communicate with your PC, but you need a cable," she says.

Many vendors leave out the cables because they don't know what type will be needed, says Frank Medina, network sales manager at Atlantic Computers Corp., a retail operation based in Waltham, Mass. Older PCs, for instance, usually require 25-pin RS-232 cables, but more recent models may require 9-pin cables, he says.

When cords and cables are included, buyers may find they aren't long enough. In particular, notebook buyers will most likely need more than the typical 6-foot cord provided by vendors to connect their notebooks to a power source, says Mark Leaser, principal at Executive PC Institute, a San Diego-based PC consulting firm specializing in sales automation.

In some cases, even replacement hard disk drives lack the metal rails needed to install them in the PC. One reason: different PC models require different types of rails. "But you would think [vendors] would say 'OK, specify which rails you want,'" says Georgia Pinis, senior information center specialist at Akron, Ohio-based Aircraft Braking Systems Corp.

To the consumer, providing drives without rails is like selling a car without tires, adds Linda Dienberg, administrative coordinator at Fujisawa Pharmaceuticals Co. in Deerfield, Ill.

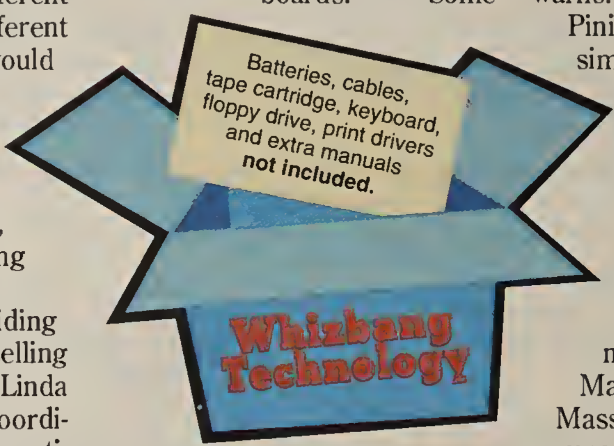
### Vendor industries

There can also be inconsistencies in the way a single vendor packages products in a given product line. Colorado Memory Systems, Inc.'s 120M-byte tape backup unit comes with a tape cartridge but its 250M-byte backup unit doesn't, Medina says.

In addition, the most basic item of all — the battery — is never a "sure thing," especially for portable modems. Many vendors don't include them because they have a limited shelf life. Conveniently, the lack of batteries also makes the product look less expensive.

Although experienced buyers have learned to avoid surprises by asking questions, even veterans can be confused when venturing into new product areas.

Several users were taken by surprise the first time they purchased Apple Computer, Inc. Macintoshes. Unlike IBM PC compatibles, Macintoshes come with monitors but not with keyboards. "Some [people] might be surprised if they're migrating from an IBM environment to an Apple one," Dienberg says.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Many buyers rely on their vendor's and favorite reseller's guidance to avoid purchasing pitfalls. But even users who have been buying from the same vendors for years have to be on guard.

"Our standard vendor changed [PC] configurations and we weren't aware of it," said Doug Jackson, associate director of academic computing at the University of North Carolina in Wilmington. When he received a new order of PCs, Jackson discovered the new configuration included a hard drive but not a floppy drive. The cost for the floppy drives was negligible, but there was a brief delay in getting the PCs up and running.

### Check the facts

One rule to live by, experienced buyers say, is to take nothing for granted. "Verify everything. Otherwise, you get burned," Gabriel warns.

Pinis experienced something similiar when purchasing laser printers for her site. She discovered that she needed to purchase laser printer drivers for the Mass-11 word processing software running on her PCs.

Microsystems Engineering Corp., which offers Mass-11, makes a special Mass-11 printer manual to accompany the printer drivers, but it didn't come with the drivers, she says. "Not only do you have to pay for [the manual]; they don't even tell you [that one exists] until you call with a problem," she says.

Another annoyance Pinis has noticed is more universal. "One of the things we find very odd is that when you buy multiuser software [for the VAX], you get [only] one manual," she says. Users of other systems, including PCs, have the same complaint.

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Juneau is a free-lance writer and editor based in Salem, Mass.

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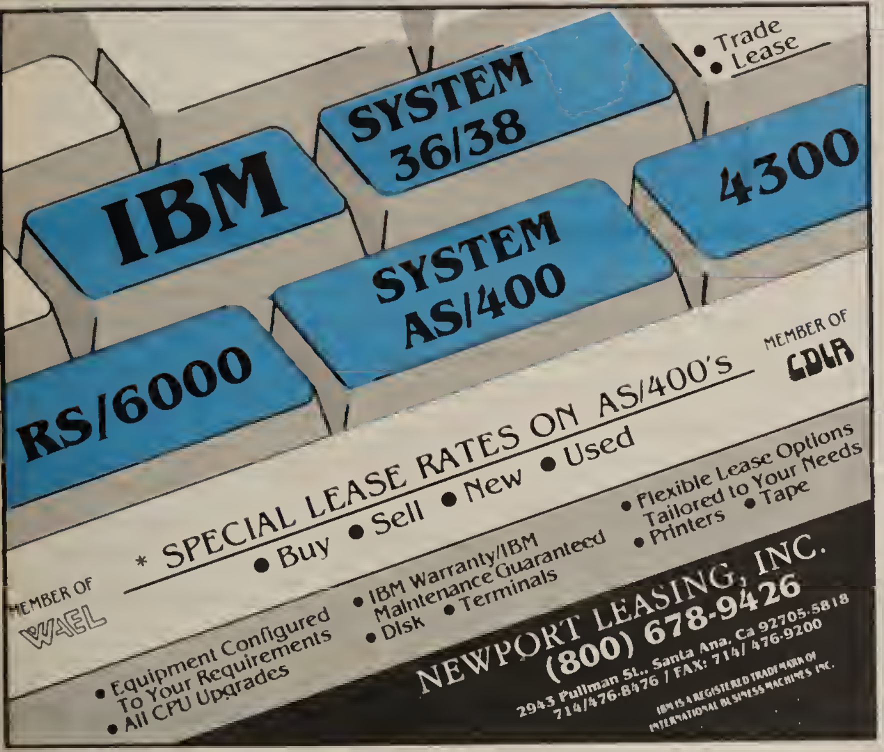

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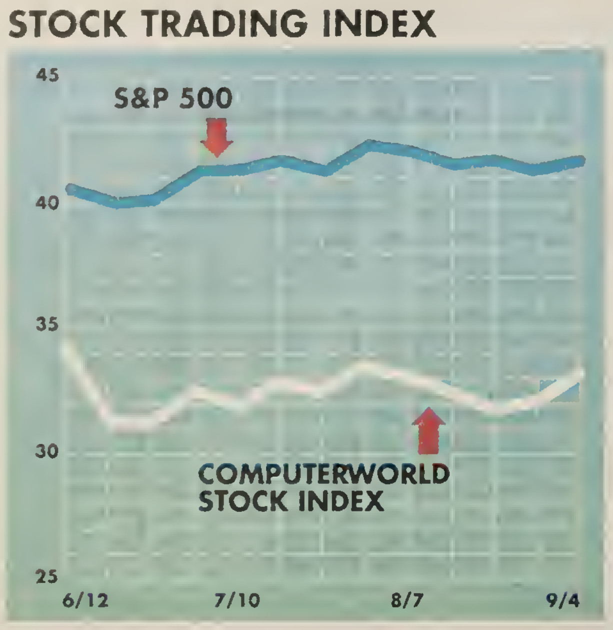

# Industry Almanac

## RECOMMENDATION CHANGES

UPGRADED FROM NEUTRAL TO BUY: **Dallas Semiconductor Corp.** (Alex. Brown & Sons, Inc.). Dallas (DS) vaulted over historically soft seasonal trends, boasting very strong sales momentum in July and August. Upward sales momentum stems from the firm's broad collection of proprietary products.

While Dallas' two biggest product lines, timekeeping (32% year-to-date sales) and nonvolatile memories (21%), seem to be on the flat side, proprietary products should be bulging to more than 60% of overall sales by the end of 1993, compared with 42% in 1991. Domestic distributors find Dallas' proprietary products appealing because they are less likely to be subject to order theft by other distributors that could provide alternative products from the competition. Rapid growth is expected to continue for the company through the first six months of 1993.

## SECTOR FOCUS: MINICOMPUTERS

*Laura Conigliaro, Lisa Cummings and Barbara Van De Wall*

Aug. 20, 1992

In order to jump-start revenues, top-line growth will need to depend on well-postured product cycles that will not require a company to fight against more than the normal drop in average selling prices. **Silicon Graphics, Inc.** (SGI), **Sun Microsystems, Inc.** (SUNW) and **Stratus Computer, Inc.** (SRA) fit this mold, with product cycles just beginning. However, revenue growth will probably not pick up until the December quarter provides a seasonal boost. **Cadence Design Systems, Inc.** (CDN), Silicon Graphics and **Sequent Computer Systems, Inc.** (SQNT) are companies that appear to have plenty of room to draw in expenses.

It is possible that Silicon Graphics' June quarter orders were up by as much as 40%. Sparking the orders were low-end Indigo workstations and the company's new midrange Crimson series. During the September quarter, Silicon Graphics plans to add to its revenue pool with shipments of the R4000-based Indigo and the Reality Engine, a high-end graphics system.

**Parametric Technology Corp.** (PMTC) consistently posts impressive earnings gains without the benefit of a giant new contract. A sharp increase in new customers — up 85% during the June quarter — benefited the company.

LISA DAVIDSON

# Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, SEPTEMBER 4, 1992

### TOP PERCENT GAINERS

| | |
|---|---|
| Meca Software | 37.50 |
| DSC Communications (H) | 34.62 |
| Chips and Technologies (L) | 25.93 |
| Sequoia Systems Inc. | 20.37 |
| Sierra Semiconductor | 20.00 |
| Ask Computer Systems | 19.81 |
| Compression Labs Inc. (L) | 18.37 |
| Advanced Micro Devices | 17.11 |

### TOP PERCENT LOSERS

| | |
|---|---|
| Wang Labs Inc. (b)* | -18.17 |
| Xilinx | -17.06 |
| Artel Communication Corp. | -16.62 |
| Digital Comm. Assoc.* | -15.44 |
| Printronix Inc. | -12.00 |
| Software Toolworks Inc. | -9.60 |
| AI Corp. | -9.38 |
| Ceridian Corp. | -8.94 |

### TOP DOLLAR GAINERS

| | |
|---|---|
| Policy Management Sys. | 5.63 |
| BMC Software Inc. | 4.63 |
| Cisco Systems Inc. | 3.88 |
| Legent Corp.* | 3.63 |
| Parametric Technology | 3.63 |
| Intel Corp.* | 3.50 |
| Synoptics Communications (H) | 3.50 |
| CompUSA Inc. | 3.38 |

### TOP DOLLAR LOSERS

| | |
|---|---|
| Xilinx | -3.63 |
| Digital Comm. Assoc.* | -2.88 |
| Information Resources | -1.50 |
| Ceridian Corp. | -1.38 |
| IBM* | -1.38 |
| Exabyte | -1.38 |
| System Software Assoc. | -1.25 |
| GTE Corp.* (H) | -1.25 |

### Communications and Network Services Up 2.88%

| Exch | 52-Week | Range | | Sept. 4 Close | Wk Net Change | Wk Pct Change |
|---|---|---|---|---|---|---|
| OTC | 15.00 | 8.00 | 3 COM Corp.* | 12.00 | 0.38 | 3.23 |
| NYS | 70.63 | 56.25 | American Info Techs Corp.* | 68.75 | 0.13 | 0.18 |
| NYS | 44.88 | 32.88 | AT&T* | 42.38 | 0.13 | 0.30 |
| OTC | 4.25 | 0.88 | Artel Communication Corp. | 0.94 | -0.19 | -16.62 |
| NYS | 50.63 | 40.25 | Bell Atlantic Corp. | 49.13 | 0.50 | 1.03 |
| NYS | 55.50 | 43.38 | Bellsouth Corp. | 53.50 | 0.00 | 0.00 |
| NYS | 6.88 | 3.75 | Bolt, Beranek & Newman (L) | 4.38 | 0.63 | 16.67 |
| NYS | 65.88 | 36.63 | Cabletron Systems | 59.25 | 2.63 | 4.64 |
| OTC | 31.00 | 17.50 | Chipcom Corp. | 25.00 | 1.00 | 4.17 |
| OTC | 53.75 | 18.63 | Cisco Systems Inc. | 50.25 | 3.88 | 8.36 |
| OTC | 35.25 | 5.75 | Compression Labs Inc. (L) | 7.25 | 1.13 | 18.37 |
| OTC | 3.38 | 0.88 | Data Switch Corp. | 1.63 | 0.19 | 13.00 |
| NYS | 23.63 | 12.75 | Digital Comm. Assoc.* | 15.75 | -2.88 | -15.44 |
| OTC | 16.75 | 8.00 | Digital Systems Int'l Inc. | 9.25 | 0.00 | 0.00 |
| OTC | 8.75 | 3.63 | DSC Communications (H) | 8.75 | 2.25 | 34.62 |
| OTC | 10.88 | 4.75 | Fibronix Int'l Inc. | 5.63 | 0.25 | 4.65 |
| OTC | 37.50 | 10.50 | Filenet Corp. | 13.75 | 0.00 | 0.00 |
| OTC | 3.38 | 1.13 | Gandalf Technologies Inc. | 2.00 | -0.13 | -5.88 |
| OTC | 2.25 | 0.69 | Gateway Communications | 1.56 | -0.13 | -7.41 |
| NYS | 5.50 | 2.13 | General Datacomm Inds. | 3.13 | 0.13 | 4.17 |
| ASE | 5.88 | 0.50 | Go Video | 2.88 | 0.25 | 9.52 |
| NYS | 35.75 | 28.63 | GTE Corp.* (H) | 33.50 | -1.25 | -3.60 |
| NYS | 70.63 | 50.00 | ITT Corp. | 65.88 | -0.25 | -0.38 |
| OTC | 36.13 | 25.25 | MCI Commmunications Corp. | 34.00 | 1.38 | 4.21 |
| OTC | 14.50 | 2.25 | Microcom Inc. | 3.63 | -0.13 | -3.33 |
| NYS | 18.25 | 9.50 | Network Equipment Tech.* | 11.00 | -0.25 | -2.22 |
| OTC | 25.50 | 8.00 | Network General | 10.00 | 0.63 | 6.67 |
| OTC | 20.00 | 8.50 | Network Systems Corp. | 11.25 | 0.13 | 1.12 |
| OTC | 17.88 | 5.63 | Newbridge Networks Corp. | 16.63 | 0.75 | 4.72 |
| NYS | 49.25 | 33.75 | Northern Telecom Ltd.* | 35.00 | 0.75 | 2.19 |
| OTC | 65.00 | 31.75 | Novell Inc.* | 51.25 | 1.00 | 1.99 |
| NYS | 88.38 | 69.13 | Nynex Corp.* | 84.38 | 1.13 | 1.35 |
| OTC | 37.50 | 16.50 | Octel Communications Corp. | 21.75 | -0.50 | -2.25 |
| OTC | 9.88 | 4.00 | Penril Data Comm. Ntwks. | 4.88 | -0.25 | -4.88 |
| OTC | 53.00 | 10.25 | Picturetel Corp. (L) | 12.38 | 0.88 | 7.61 |
| OTC | 18.75 | 9.75 | Proteon Inc. | 14.00 | 1.25 | 9.80 |
| NYS | 28.00 | 11.63 | Scientific Atlanta Inc. (H) | 27.25 | 0.50 | 1.87 |
| NYS | 69.00 | 53.75 | Southwestern Bell Corp. | 67.38 | 0.75 | 1.13 |
| NYS | 26.38 | 20.75 | Sprint Corp. | 22.88 | -0.25 | -1.08 |
| OTC | 13.75 | 4.00 | Standard Microsystems Corp | 13.50 | 0.63 | 4.85 |
| OTC | 38.38 | 14.25 | Synoptics Communications (H) | 38.38 | 3.50 | 10.04 |
| NYS | 40.00 | 32.88 | US West Inc. | 39.50 | 1.50 | 3.95 |
| OTC | 41.50 | 24.00 | Wellfleet Communications | 39.25 | 1.00 | 2.61 |

### PC and Workstations Up 2.13%

| Exch | 52-Week | Range | | Sept. 4 Close | Wk Net Change | Wk Pct Change |
|---|---|---|---|---|---|---|
| OTC | 14.50 | 4.50 | Advanced Logic Research | 4.75 | 0.25 | 5.56 |
| OTC | 70.00 | 42.75 | Apple Computer Inc.* | 47.25 | 2.25 | 5.00 |
| OTC | 32.25 | 11.25 | AST Research Inc.* | 13.00 | 0.75 | 6.12 |
| NYS | 19.25 | 6.75 | Commodore Int'l | 8.50 | 1.00 | 13.33 |
| NYS | 35.75 | 22.13 | Compaq Computer Corp.* | 32.50 | 1.88 | 6.12 |
| OTC | 29.00 | 13.91 | Dell Computer Corp. | 25.00 | 0.13 | 0.50 |
| OTC | 7.75 | 2.00 | Everex Systems Inc. (L) | 2.13 | -0.13 | -5.56 |
| NYS | 34.00 | 21.25 | Harris Corp. | 29.75 | 0.38 | 1.28 |
| NYS | 85.00 | 44.63 | Hewlett-Packard Co.* | 55.88 | 0.13 | 0.22 |
| NYS | 29.75 | 14.13 | Silicon Graphics | 22.63 | 0.75 | 3.43 |
| OTC | 35.88 | 20.75 | Sun Microsystems Inc.* | 27.88 | 1.25 | 4.69 |
| NYS | 31.25 | 22.25 | Tandy Corp.* | 23.63 | -0.25 | -1.05 |
| NYS | 11.13 | 5.13 | Zenith Electronics | 6.75 | -0.13 | -1.82 |
| OTC | 25.50 | 2.88 | Zeos International Ltd. | 2.88 | -0.25 | -8.00 |

### Large Systems Up 0.07%

| Exch | 52-Week | Range | | Sept. 4 Close | Wk Net Change | Wk Pct Change |
|---|---|---|---|---|---|---|
| ASE | 20.63 | 11.63 | Amdahl Corp.* | 13.75 | 0.25 | 1.85 |
| NYS | 15.50 | 6.41 | Ceridian Corp. | 14.00 | -1.38 | -8.94 |
| NYS | 16.38 | 5.38 | Convex Computer (L) | 5.38 | -0.50 | -8.51 |
| OTC | 19.63 | 1.88 | Cray Computer | 3.63 | 0.38 | 11.54 |
| NYS | 52.25 | 22.75 | Cray Research Inc.* | 25.00 | 1.38 | 5.82 |
| NYS | 22.50 | 7.13 | Data General Corp. | 8.38 | 0.63 | 8.06 |
| NYS | 65.50 | 33.25 | Digital Equipment Corp.* | 35.88 | -0.75 | -2.05 |
| NYS | 106.38 | 81.63 | IBM* | 86.00 | -1.38 | -1.57 |
| OTC | 13.25 | 7.50 | Kendall Square Research | 8.75 | -0.25 | -2.78 |
| NYS | 121.25 | 88.25 | Matsushita Electronics | 101.50 | 1.00 | 1.00 |
| OTC | 19.75 | 7.50 | Pyramid Technology | 8.13 | -0.38 | -4.41 |
| OTC | 17.88 | 8.13 | Sequent Computer Sys. | 14.63 | -0.88 | -5.65 |
| OTC | 18.38 | 5.00 | Sequoia Systems Inc. | 8.13 | 1.38 | 20.37 |
| NYS | 54.25 | 36.75 | Stratus Computer Inc.* | 44.00 | 1.63 | 3.83 |
| NYS | 15.13 | 9.50 | Tandem Computers Inc.* | 10.75 | 0.38 | 3.61 |
| NYS | 11.75 | 3.63 | Unisys Corp.* | 8.88 | -0.25 | -2.74 |
| ASE | 7.50 | 0.25 | Wang Labs Inc. (b)* | 0.56 | -0.13 | -18.17 |

### Software Up 3.99%

| Exch | 52-Week | Range | | Sept. 4 Close | Wk Net Change | Wk Pct Change |
|---|---|---|---|---|---|---|
| OTC | 68.50 | 34.75 | Adobe Systems Inc. | 34.75 | 1.75 | 5.30 |
| OTC | 13.25 | 2.50 | AI Corp. | 3.63 | -0.38 | -9.38 |
| OTC | 45.00 | 11.50 | Aldus Corp. | 12.25 | 0.25 | 2.08 |
| OTC | 19.75 | 8.50 | American Software Inc. | 9.63 | 0.75 | 8.45 |
| OTC | 20.00 | 9.75 | Ask Computer Systems | 15.88 | 2.63 | 19.81 |
| OTC | 52.00 | 23.25 | Autodesk Inc. | 48.75 | 3.25 | 7.14 |
| OTC | 37.75 | 7.50 | Bachman Info. Systems (L) | 8.75 | 1.13 | 14.75 |
| OTC | 42.50 | 30.50 | BGS Systems Inc. | 37.50 | -1.00 | -2.60 |
| OTC | 79.00 | 37.25 | BMC Software Inc. | 54.38 | 4.63 | 9.30 |
| OTC | 20.50 | 9.00 | Boole & Babbage | 18.75 | 0.50 | 2.74 |
| OTC | 86.75 | 35.00 | Borland Int'l Inc.* | 42.50 | 2.25 | 5.59 |
| OTC | 11.25 | 3.63 | CE Software | 4.00 | -0.13 | -3.03 |
| ASE | 16.13 | 6.50 | Cheyenne Software Inc. (H) | 16.13 | 1.50 | 10.26 |
| OTC | 20.38 | 7.25 | Cognos Inc. | 7.25 | -0.50 | -6.45 |
| NYS | 17.00 | 7.50 | Computer Associates* | 14.50 | 0.63 | 4.50 |
| NYS | 12.38 | 9.75 | Computervision Corp. (L) | 10.38 | 0.50 | 5.06 |
| OTC | 21.25 | 8.00 | Comshare Inc. (L) | 8.38 | 0.00 | 0.00 |
| OTC | 47.88 | 6.50 | Easel Corp. | 8.25 | -0.13 | -1.49 |
| OTC | 25.50 | 11.50 | Group I Software | 16.25 | 1.25 | 8.33 |
| OTC | 6.63 | 3.50 | Hogan Systems Inc. | 4.50 | 0.00 | 0.00 |
| OTC | 36.25 | 18.50 | Information Resources | 21.50 | -1.50 | -6.52 |
| OTC | 39.75 | 6.00 | Informix Corp. | 38.00 | 0.50 | 1.33 |
| OTC | 22.38 | 12.50 | Intergraph Corp. | 14.50 | 0.75 | 5.45 |
| OTC | 15.00 | 6.25 | Interleaf Inc. | 9.88 | 1.13 | 12.86 |
| OTC | 20.25 | 9.75 | Intersolv Inc. | 14.38 | -0.75 | -4.96 |
| OTC | 24.00 | 10.50 | Knowledgeware Inc. | 11.75 | 0.13 | 1.08 |
| OTC | 45.25 | 24.50 | Legent Corp.* | 44.63 | 3.63 | 8.84 |
| OTC | 38.75 | 15.50 | Lotus Development* | 17.50 | 1.25 | 7.69 |
| OTC | 7.38 | 1.88 | Meca Software | 2.75 | 0.75 | 37.50 |
| OTC | 22.25 | 6.50 | Mentor Graphics | 7.75 | -0.25 | -3.13 |
| OTC | 37.25 | 27.25 | Micro Focus | 34.50 | 2.38 | 7.39 |
| OTC | 20.50 | 6.50 | Micrografx Inc. | 8.63 | 0.63 | 7.81 |
| OTC | 88.84 | 53.34 | Microsoft Corp.* | 76.00 | 1.63 | 2.18 |
| OTC | 21.13 | 10.25 | Oracle Corp.* | 18.50 | 1.13 | 6.47 |
| OTC | 44.38 | 15.50 | Parametric Technology | 44.38 | 3.63 | 8.90 |
| OTC | 11.00 | 3.50 | Phoenix Technologies | 4.25 | 0.13 | 3.03 |
| OTC | 25.25 | 12.13 | Platinum Technology | 16.75 | 0.38 | 2.29 |
| OTC | 46.50 | 29.00 | Progress Software Corp. | 39.75 | -0.25 | -0.63 |
| OTC | 26.63 | 4.00 | Quarterdeck Office Sys. | 4.50 | 0.13 | 2.86 |
| OTC | 32.75 | 11.75 | Rainbow Technologies Inc. | 16.88 | 0.63 | 3.85 |
| OTC | 26.25 | 7.50 | Rasterops | 9.50 | -0.50 | -5.00 |
| OTC | 17.25 | 5.38 | Ross Systems | 7.38 | 0.50 | 7.27 |
| OTC | 12.13 | 8.50 | Sapiens USA Inc. | 11.75 | 1.00 | 9.30 |
| OTC | 26.25 | 7.50 | Software Publishing Corp. | 10.00 | 0.00 | 0.00 |
| OTC | 8.50 | 2.00 | Software Toolworks Inc. | 2.94 | -0.31 | -9.60 |
| OTC | 7.25 | 1.75 | Spinnaker Software | 2.25 | -0.13 | -5.26 |
| OTC | 16.50 | 6.25 | State of the Art | 6.63 | 0.13 | 1.92 |
| NYS | 25.25 | 13.75 | Sterling Software Inc. | 18.63 | 0.38 | 2.05 |
| OTC | 30.00 | 12.50 | Struct. Dynamics Research | 15.00 | 1.75 | 13.21 |
| OTC | 31.75 | 15.25 | Sybase Inc. | 30.50 | 1.25 | 4.27 |
| OTC | 51.00 | 15.50 | Symantec Corp. | 16.50 | -0.50 | -2.94 |
| NYS | 15.50 | 5.25 | Systems Center Inc.* | 6.25 | 0.50 | 8.70 |
| OTC | 34.25 | 12.50 | System Software Assoc. | 24.75 | -1.25 | -4.81 |
| OTC | 23.75 | 14.50 | Walker Interactive Systems | 18.25 | 2.50 | 15.87 |
| OTC | 6.63 | 2.13 | Wordstar | 2.25 | 0.00 | 0.00 |

### Semiconductors Up 7.59%

| Exch | 52-Week | Range | | Sept. 4 Close | Wk Net Change | Wk Pct Change |
|---|---|---|---|---|---|---|
| NYS | 21.50 | 7.38 | Advanced Micro Devices | 11.13 | 1.63 | 17.11 |
| NYS | 11.13 | 7.00 | Analog Devices Inc. | 9.88 | 0.38 | 3.95 |
| OTC | 13.38 | 6.75 | Atmel Corp. | 9.50 | 1.25 | 15.15 |
| OTC | 14.13 | 3.25 | Chips and Technologies (L) | 4.25 | 0.88 | 25.93 |
| NYS | 21.50 | 7.38 | Cypress Semiconductor Corp | 9.63 | 1.00 | 11.59 |
| NYS | 11.13 | 6.25 | Dallas Semiconductor | 11.13 | 1.13 | 11.25 |
| OTC | 68.75 | 38.50 | Intel Corp.* | 61.25 | 3.50 | 6.06 |
| NYS | 9.88 | 4.88 | LSI Logic Corp. (L) | 5.75 | 0.38 | 6.98 |
| NYS | 22.38 | 12.13 | Micron Technology | 14.75 | -0.50 | -3.28 |
| NYS | 88.13 | 54.00 | Motorola Inc.* | 88.00 | 2.13 | 2.47 |
| NYS | 11.75 | 3.88 | National Semiconductor* | 10.88 | 0.88 | 8.75 |
| OTC | 27.00 | 8.25 | Sierra Semiconductor | 12.00 | 2.00 | 20.00 |
| NYS | 42.38 | 26.00 | Texas Instruments* | 40.75 | 1.88 | 4.82 |
| OTC | 10.50 | 6.00 | VLSI Technology | 7.75 | 0.75 | 10.71 |
| OTC | 8.75 | 2.13 | Weitek | 2.88 | -0.25 | -8.00 |
| ASE | 5.63 | 2.00 | Western Digital Corp. | 4.63 | 0.38 | 8.82 |
| OTC | 32.50 | 17.25 | Xilinx | 17.63 | -3.63 | -17.06 |
| OTC | 11.50 | 4.63 | Zilog Inc. (L) | 7.38 | 0.75 | 11.32 |

### Peripherals and Subsystems Up 2.58%

| Exch | 52-Week | Range | | Sept. 4 Close | Wk Net Change | Wk Pct Change |
|---|---|---|---|---|---|---|
| OTC | 10.00 | 2.75 | Archive Corp. | 7.63 | 0.13 | 1.67 |
| OTC | 26.50 | 12.50 | Banctec Inc. | 25.75 | 0.38 | 1.48 |
| OTC | 23.50 | 8.63 | Cambex Corp. | 11.50 | 0.00 | 0.00 |
| ASE | 12.25 | 4.91 | Cognitronics Corp. | 11.38 | 1.25 | 12.35 |
| NYS | 23.88 | 12.50 | Conner Peripherals* | 21.00 | 1.63 | 8.39 |
| ASE | 19.66 | 4.38 | Dataram Corp. | 7.25 | 0.00 | 0.00 |
| NYS | 19.25 | 5.88 | EMC Corp. | 16.63 | -0.13 | -0.75 |
| OTC | 8.38 | 4.75 | Emulex Corp. | 6.13 | 0.00 | 0.00 |
| OTC | 23.00 | 14.25 | Evans & Sutherland | 15.75 | 0.00 | 0.00 |
| OTC | 40.63 | 19.88 | Exabyte | 22.25 | -1.38 | -5.82 |
| OTC | 27.25 | 15.75 | Intelligent Info. Systems | 23.50 | 1.50 | 6.82 |
| OTC | 11.25 | 4.75 | Iomega Corp. | 6.88 | -0.25 | -3.51 |
| OTC | 34.75 | 10.25 | IPL Systems Inc. (L) | 10.75 | -0.25 | -2.27 |
| OTC | 24.50 | 10.75 | Komag Inc. | 17.25 | 1.50 | 9.52 |
| OTC | 14.63 | 3.44 | Maxtor Corp.* (H) | 14.38 | 0.63 | 4.55 |
| OTC | 12.63 | 5.75 | Micropolis Corp. | 9.25 | 0.50 | 5.71 |
| NYS | 101.25 | 85.25 | 3M Co. | 99.50 | 1.00 | 1.02 |
| OTC | 7.00 | 3.50 | Printronix Inc. | 5.50 | -0.75 | -12.00 |
| NYS | 26.75 | 7.00 | QMS Inc. | 9.00 | 0.50 | 5.88 |
| OTC | 18.00 | 8.88 | Quantum Corp. | 14.63 | 0.88 | 6.36 |
| OTC | 12.75 | 6.00 | Radius Inc. | 7.25 | 0.50 | 7.41 |
| NYS | 12.88 | 5.88 | Recognition Equipment | 9.88 | 0.50 | 5.33 |
| OTC | 13.13 | 5.38 | Rexon Inc. | 9.63 | 0.13 | 1.32 |
| OTC | 17.63 | 7.25 | Seagate Technology* | 14.50 | 1.13 | 8.41 |
| NYS | 78.00 | 26.75 | Storage Technology* | 29.00 | 0.50 | 1.75 |
| NYS | 29.63 | 16.00 | Tektronix Inc. | 20.50 | 1.00 | 5.13 |
| NYS | 82.25 | 56.88 | Xerox Corp. | 76.25 | 0.63 | 0.83 |

### Services Up 3.70%

| Exch | 52-Week | Range | | Sept. 4 Close | Wk Net Change | Wk Pct Change |
|---|---|---|---|---|---|---|
| OTC | 19.25 | 11.66 | American Mgmt. Systems* | 19.25 | 0.50 | 2.67 |
| NYS | 5.38 | 2.88 | Anacomp Inc. | 3.13 | 0.00 | 0.00 |
| OTC | 19.00 | 12.50 | Analysts Int'l | 18.50 | 1.00 | 5.71 |
| NYS | 49.00 | 32.38 | Auto Data Processing* | 45.13 | 2.00 | 4.64 |
| NYS | 24.16 | 12.50 | Comdisco Inc.* | 16.00 | -0.50 | -3.03 |
| OTC | 13.50 | 7.75 | Computer Horizons | 8.25 | -0.25 | -2.94 |
| NYS | 84.88 | 57.00 | Computer Sciences* | 65.88 | 1.75 | 2.73 |
| NYS | 10.13 | 7.00 | Computer Task Group | 8.25 | 0.13 | 1.54 |
| OTC | 40.50 | 15.00 | CompUSA Inc. | 29.38 | 3.38 | 12.98 |
| OTC | 19.25 | 6.00 | Corporate Software (L) | 8.00 | 0.88 | 12.28 |
| OTC | 30.75 | 9.25 | Egghead Discount Software (L) | 10.50 | 0.25 | 2.44 |
| NYS | 33.06 | 23.19 | General Motors E (EDS)* | 29.13 | 0.38 | 1.30 |
| OTC | 30.38 | 6.25 | Intelligent Electronics | 9.50 | -0.13 | -1.30 |
| OTC | 14.88 | 3.13 | Merisel | 8.00 | 1.00 | 14.29 |
| OTC | 15.75 | 7.00 | Microage Inc. | 9.38 | 0.88 | 10.29 |
| OTC | 29.00 | 15.50 | Paychex (H) | 27.00 | -0.25 | -0.92 |
| NYS | 75.13 | 48.50 | Policy Management Sys. | 75.13 | 5.63 | 8.09 |
| NYS | 44.50 | 22.63 | Reynolds and Reynolds | 42.13 | 0.38 | 0.90 |
| OTC | 32.00 | 21.25 | SEI Corp. | 24.75 | 1.75 | 7.61 |
| OTC | 24.38 | 16.88 | Shared Medical Systems | 19.63 | -0.38 | -1.88 |
| OTC | 27.38 | 13.50 | Sungard Data Systems (H) | 26.75 | 1.00 | 3.88 |
| NYS | 3.75 | 1.13 | Ultimate Corp. | 1.63 | 0.00 | 0.00 |

KEY: (H) = New annual high (L) = New annual low

* Companies tracked in Computerworld Stock Index

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IN BRIEF

## IBM buys into Synon

- As expected, **IBM** [CW, Aug. 31] announced that it plans to buy a 10% stake in **Synon Corp.** for an undisclosed sum. IBM expects to make the application development tool maker's CSG software the sole code generator for building Application System/400 programs under AD/Cycle. IBM will continue to target its own generator, Cross System Product, at mainframe and small systems applications.

- **The Software Publishers Association** said second-quarter personal computer application software sales reached $1.49 billion, an increase of 20% from the corresponding period last year. Windows applications hit $526 million, up 181% from 1991's second quarter. Spreadsheets displaced word processors as the largest application area, with sales of $236 million in the quarter, the Washington D.C.-based organization said.

- U.S. marshals, at the behest of **Microsoft Corp.**, last week seized 2,000 counterfeit copies of Microsoft software at **Number One International, Inc.**, a South El Monte, Calif., distributor. The Redmond, Wash., software giant also slapped Number One and its president, Randy Wang, with a trademark and copyright infringement suit.

**Short takes**

The **Microelectronics & Computer Technology Corp.** consortium last week formed a venture capital company to invest in projects spun off from the Austin, Texas, research and development firm. The consortium hopes to use capital supplied by outside investors and member companies to keep scientists within its fold.... Underwriters of **Banyan Systems, Inc.**'s initial public offering have used their overallotment option to purchase an additional 400,000 shares of Banyan stock.

# SPARC seeds sown in Russian soil

*Sun signs up 33 more computer scientists to advance SPARC compiler technology in Moscow*

BY MARYFRAN JOHNSON
CW STAFF

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc. staked a second claim in Russian territory last week through a novel software development contract with a group of computer scientists in the former Soviet Union.

The move could reserve an important place for Sun on the ground floor of Russia's computer industry, which is struggling to recast itself for the economic realities of East/West business competition, analysts said.

Sun's SunPro subsidiary unveiled an agreement with 33 Russian computer scientists who will work under a six-month, renewable contract to advance Scalable Processor Architecture (SPARC) compiler technology. They will expand the mission of the 50 Russian computer scientists already working for Sun in the recently formed Moscow Center for SPARC Technology.

The center is led by Boris Babaian, the preeminent supercomputer expert in the former Soviet Union.

"This cooperation makes it possible for us to continue our work in this industry," said Babaian, whose Elbrus supercomputer became obsolete once the Iron Curtain collapsed and competing Western vendors entered with faster, cheaper technology.

Established five months ago, the Moscow SPARC center is a Russian/American joint venture, funded by Sun through contract research. Evidence of this latest collaboration should show up in early 1994 in the form of improved compilers and tools for the Fortran and Pascal languages, plus optimized performance for SunPro's SPARCompiler products.

**Moscow's Babaian:** *The alliance will 'resurrect' high-tech in his country*

"What Sun is doing is a kind of affirmative action for Russia," said Esther Dyson, publisher of "Rel-East," an East/West high-tech business information newsletter based in New York. "They have first crack at a resource most people ignore."

Multiprocessing techniques and parallel processing technology are key specialties of Babaian's researchers, who make up an elite core among the 1,000 employees at the Russian Academy of Science's Institute of Precise Mechanics and Computer Equipment in Moscow.

"This isn't a bunch of PC hackers learning Windows," Dyson added. "This is serious computer science."

The design of Sun's SuperSPARC Viking chip, with its highly parallel reduced instruction set computing architecture, is similar to the work Babaian and his engineers did on the Elbrus supercomputer. Collaboration with the Russians during the past year has already altered Sun's future implementation of a 64-bit SPARC architecture, said David Ditzel, director of advanced development at Sun.

Yet while the concept sounds grand, the reality of working together across thousands of miles with unreliable phone lines and a 12-hour time difference is still largely untested. The Sun engineering teams will communicate mainly via electronic mail — in English — with Russian software designers at sites in Moscow, St. Petersburg and Novosibirsk in Siberia.

Gaining a foothold in the research community and among software developers is Sun's tried-and-true method of breaking into new markets, said Eric Schmidt, president of Sun Technology Enterprises, one of Sun's six subsidiaries.

Babaian and nine of his researchers were in California last week to meet their Sun colleagues and soak up some business education seminars at Stanford University along with the sunshine. An avuncular, good-humored man who takes care to avoid making predictions about Russia's future, Babaian said the Sun alliance will help "resurrect" his own country's floundering technology industry.

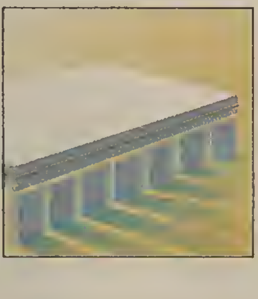
Yet the Russian alliance means far more than goodwill for Sun. Company officials spoke frankly about the business opportunities to be had selling workstations into Russian industries such as banking, telecommunications and oil exploration.

# Cyrix seeks route into Intel 386 market

*Upgrade path to 486 PCs could go down to $300*

BY MICHAEL FITZGERALD
CW STAFF

RICHARDSON, Texas — Like a gnat looking for weak spots in a hippo's hide, Cyrix Corp. continues to search for markets that Intel Corp. has failed to find.



Its latest approach is not so much technical as marketing-driven: Cyrix officials are looking to sell their CX486DLC processor upgrade directly to corporate users.

The 486DLC has three versions that range from slightly less powerful than an Intel 25-MHz I486DX to slightly more powerful than a 33-MHz 486DX; all fit into the smaller 386DX socket.

James Chapman, Cyrix's vice president of marketing, said Cyrix has established a corporate beta-test program in which 10 to 12 major corporations are testing Cyrix's 486DLC, with a bent toward installing it directly in 386-based systems.

While upgrades to date have not been common, Cyrix said the ability to pop a 486-class chip into a 386DX socket could spark a market. The company said it came up with the idea when its current beta-test users called for it.

One beta-test user at a major West Coast company, who spoke on the condition of anonymity, said his company is testing the Cyrix upgrade chip because "as we move into an area with graphical interfaces, the 386 processor seems to be interminably slow" because it lacks onboard cache.

Accelerator cards do not improve performance enough to make a major investment in the technology worthwhile, the user said.

He said new 486-based machines cost at least $5,000 each, and with the potential to replace 20,000 386-based systems, using the Cyrix upgrade chip could save the company $1 million.

Cyrix said its program is targeted only at large companies with internal information systems staffs that do their own maintenance and upgrade work.

If the strategy works, Cyrix said, more corporations will buy Cyrix-based personal computers in the future, rather than strictly Intel-based PCs. No PC vendor with a major corporate presence has announced a Cyrix-based product.

"This is a Trojan horse for Cyrix into the Fortune 1,000," Chapman said.

### Legal battles ahead

Of course, Cyrix still has to survive legal hurdles with Intel. While Cyrix won a recent decision against Intel, the court simply gave Cyrix the ability to continue manufacturing its chips.

The court will not decide the real question of whether Cyrix has infringed on an Intel patent with its processor until sometime next year.

Meanwhile, Cyrix's upgrade would give users a significant break on costs. If users like what they see in their tests, Cyrix will sell a special upgrade-ready version of the chip for a target price of $300 each.

"I would say it makes a lot of sense, considering how lucrative [the upgrade] market can be," said Dean McCarron, an analyst at In-Stat, Inc. in Phoenix. McCarron said the potential market was the entire universe of 386DX-based systems. He also said Cyrix may benefit from its experience in the math coprocessor market, where corporations often buy directly from the maker.

Cyrix, which hopes to begin selling the chip directly to corporations in the first quarter of 1993, said it intends to sell its upgrade chip through retail channels starting late this year or early in 1993.

Chapman also said Cyrix is working on its version of Intel's P5, the 486 follow-on. He said Intel's need to stay compatible with existing software gives Cyrix a target to shoot for, despite the lack of a physical chip to benchmark against.

# TRENDS

## Mainframe acquisitions

**For many organizations, the largest single capital investment ever made is a mainframe. According to a survey of 1,000 mainframe sites, IS managers are still more apt to purchase and hold onto a mainframe rather than lease one.**

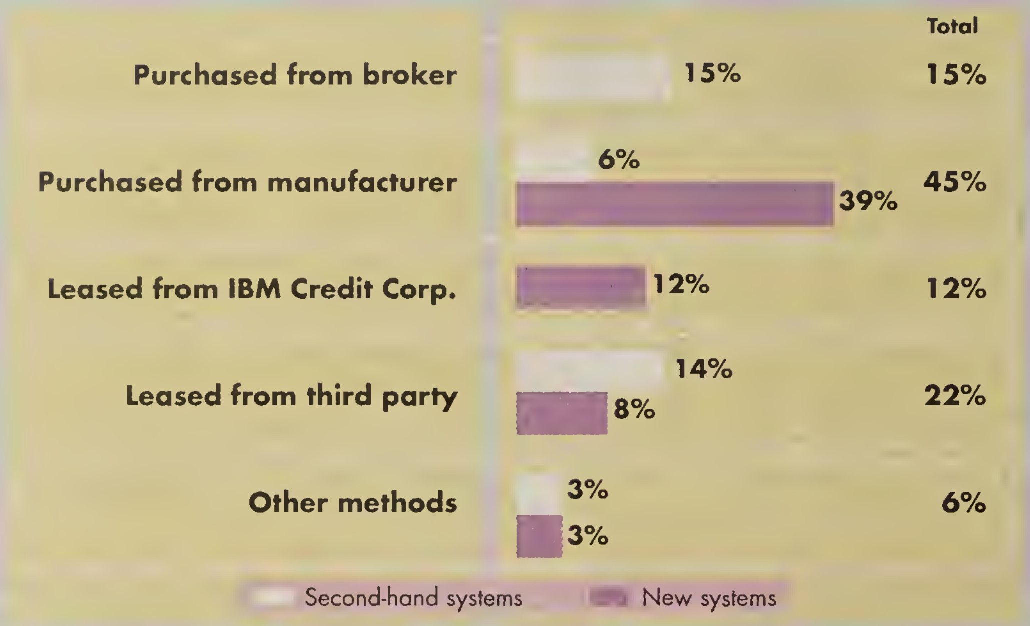
### Procurement

**The preferred method of obtaining mainframes is buying them outright. In the respondent base, 60% were purchased and only 34% were leased.**

### Hold the upgrade (for now)

**Out of 980 installed CPUs, IS managers plan to upgrade or replace only 23% of them in the next six months.**

### Where do IS managers get their mainframes?



### Lease commitment

**Leases on second-hand systems tend to be shorter than for new ones:**

***New systems 45 months**

***Used systems 37 months**

***Average initial duration of leases**

### Big guns

**IBM Credit Corp. accounts for almost 40% of all leases in the sample, including 56% of the leases for new systems. Next largest is Comdisco, with 15% of the responding market.**

Source: Xephon/WPWS, Oviedo, Fla.

CW Chart: Michael Siggins

## NEXT WEEK

**Bill Knobles** doesn't have time to sit by the pool lately. As MIS manager at Baltimore's Omni Inner Harbor Hotel, he is trying to make the best of tight times — and he's got plenty of company. Yet despite pressures to do more with less, many IS professionals are *more* satisfied with their jobs. Find out more in our annual Job Satisfaction report. ▶

Katherine Lambert

The hot spot in forms automation is what is happening on personal computer platforms, particularly the distributing of forms to remote terminals on disk and via network electronic mail. The author of In Depth reveals what the hubbub is all about as well as what factors could hold back forms automation in an organization.

# INSIDE LINES

### The unkindest cut

▶ One aspect of IBM's new PC company that is not being discussed much is the number of employees who won't be transferred. Naturally, IBM, being what it is, is not using the "L" word, but sources said approximately 30%, or 6,000 NDD employees, have reportedly already taken advantage of such offers as early retirement programs. Some of the parachutes glint golden: pen and tablet guru Kathy Veith is reportedly spending her newfound free time in a new home in Vail, Colo.

### Polyglutonous networking

▶ Tomorrow, DEC is expected to make its long-awaited announcement of a link between DECmcc Director and IBM's NetView, which DEC co-developed with Systems Center, Inc. The software is expected to let DECmcc manage IBM SNA systems and provide DEC network management capabilities to NetView and Systems Center's NetView/Master.

### Sparks will fly

▶ At a product splash slated for early December, Sun plans to unveil a 20-processor SPARCserver and new low-end systems and multiprocessor desktop machines. Sun President Scott McNealy said prices for Sun servers will remain below the $200,000 mark, however. The new systems will run Solaris 2.0 and its subsequent versions only, as Sun migrates users from SunOS and Solaris 1.0 to the newer operating system based on Unix System V, Release 4.

### Allies no more

▶ Effectively slamming the door after its exit from the AD/Cycle alliance, Intersolv plans to roll out a new version of APS, a code generator that went head-to-head with IBM's Cross System Product (CSP). Expected late this month, APS 2.2 will target client/server applications for OS/2-based clients. IBM, meanwhile, intends to revamp CSP to produce both mainframe and OS/2 code. The delivery date is undefined.

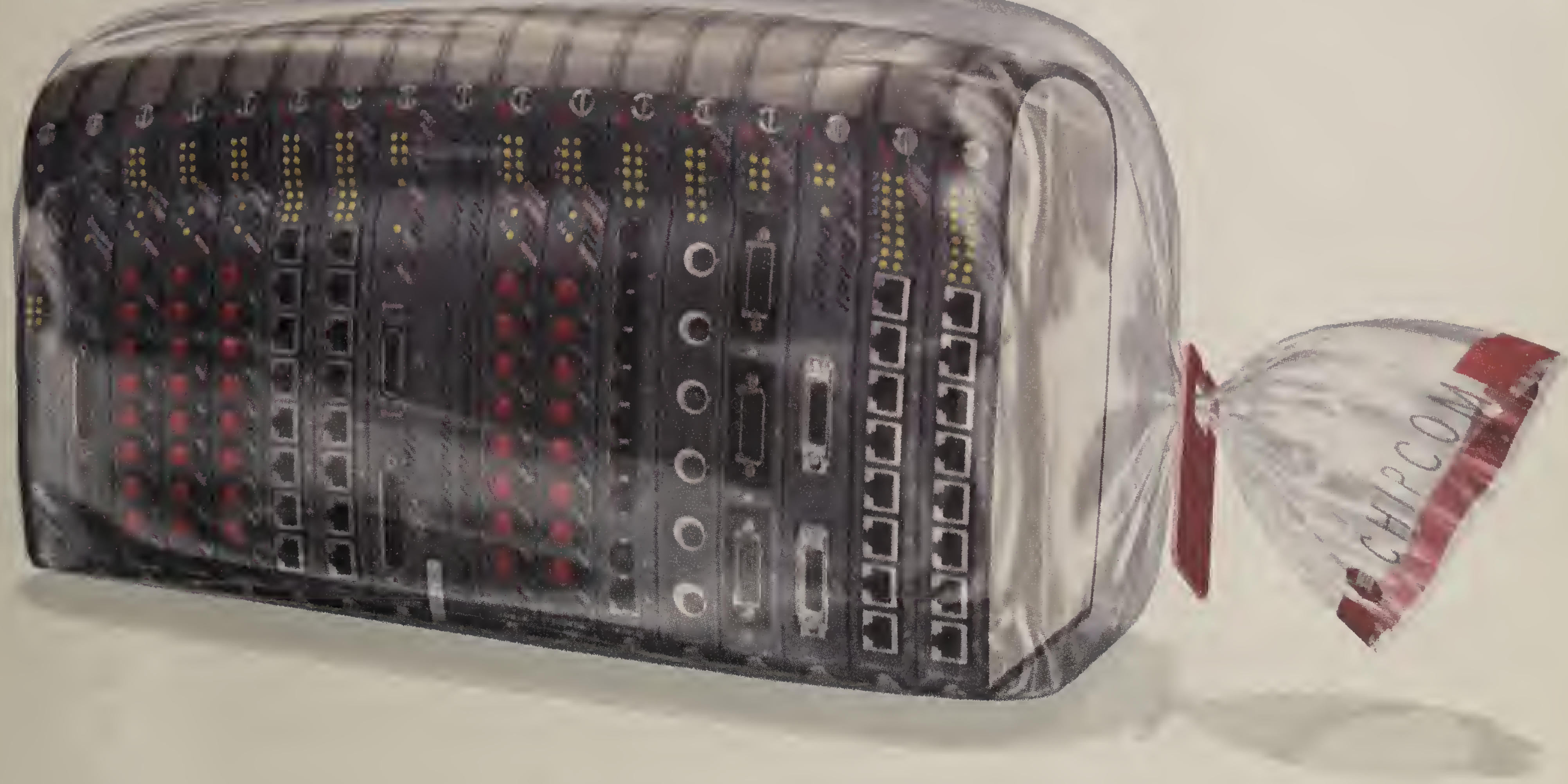
### OTC burglary tools?

▶ HP recently unveiled an accessory to its popular LaserJet printers that may be very popular with an unforeseen customer — check forgers. The package reproduces the little numbers on checks that are scanned and read in bank clearinghouses, reducing the cost of payroll checks to about 10 cents each, instead of the $1 apiece that a check-printing service charges. Also, a $3,000 laser printer compares favorably with $10,000 and up for a special-purpose check printer. Observers such as ANSI's Roy Van Denburgh fear the package — which includes a $169 toner cartridge containing special ink and a $249 font program needed to make the magnetic-ink character recognition code — will reduce the cost of forgery.

### Down, but not out (yet)?

▶ Sources close to Momenta say the company has finally filed for Chapter 11 bankruptcy protection, after a few months of struggling to find a buyer. Word is the company could now be had so cheaply that someone may buy it, and sources say more than one investor is sniffing. The sources said John Rizzo, former vice president of marketing at Momenta, might be tapped to run a reincarnated company that would market several products Momenta was close to completing.

*While PCs are the usual target of viruses, Unix-based workstations could be next. Unix machines have so far been protected by the variety of operating system variants, including I/O media that typically harbor PC viruses, but they are far from immune. From an internal Intergraph paper on this issue: "The potential threat . . . is greater than what has actually been observed. . . . Viruses can spread anywhere that programs are shared. . . . A very good culture medium, therefore, is a LAN with many PCs and one or a few file servers. . . . A non-PC file server could be carrying programmed threats to which it is itself immune and passing them on to PCs which execute programs from the file server." Experts suggest that a good checksum program would be a nice addition to any network. So would some news tips. Phone, fax or CompuServe News Editor Alan Alper at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try* Computerworld*'s 24-hour voice-mail tip line at (508) 820-8555.*



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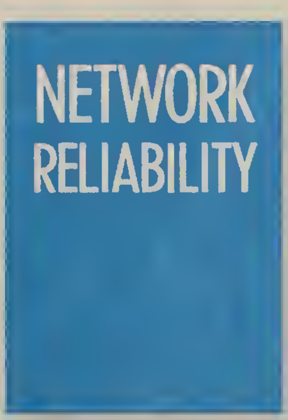

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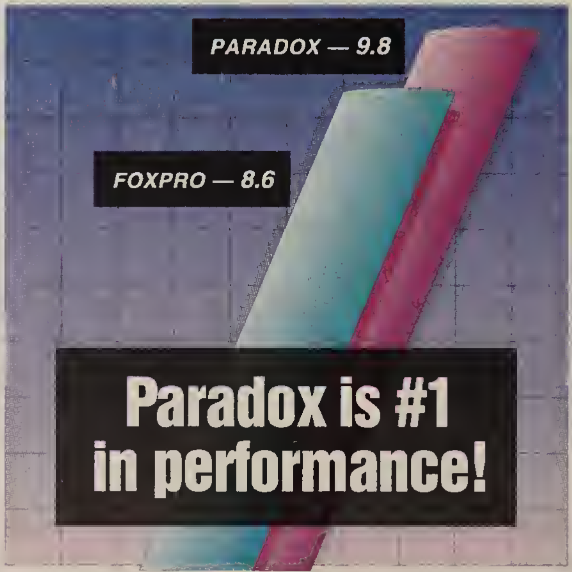

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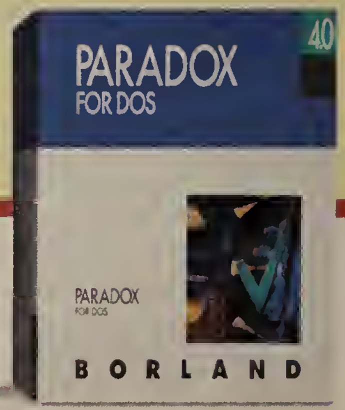

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